
TRACTOR, CRAWLER,
DIESEL,
70 to 90-DBHP, STANDARD,
INTERNATIONAL TD-18,
74-inch GAGE



MAINTENANCE INSTRUCTIONS AND PARTS CATALOG

JANUARY 1945

TracTractor Model TD-18

OPERATIONS SECTION

Each section has a black tab which lines up with the corresponding section name and number shown at the right.

The black tabs are quickly located by bending this book back.

INTERNATIONAL HARVESTER COMPANY
180 NORTH MICHIGAN AVE. CHICAGO 1, ILLINOIS, U.S.A.

GENERAL
DRIVING INSTRUCTIONS

6

BRAKES
(STEERING)

1

CHASSIS

2

CLUTCHES

3

COOLING SYSTEM

4

ELECTRICAL
AND MAGNETO

5

ENGINE

6

FUEL SYSTEM

7

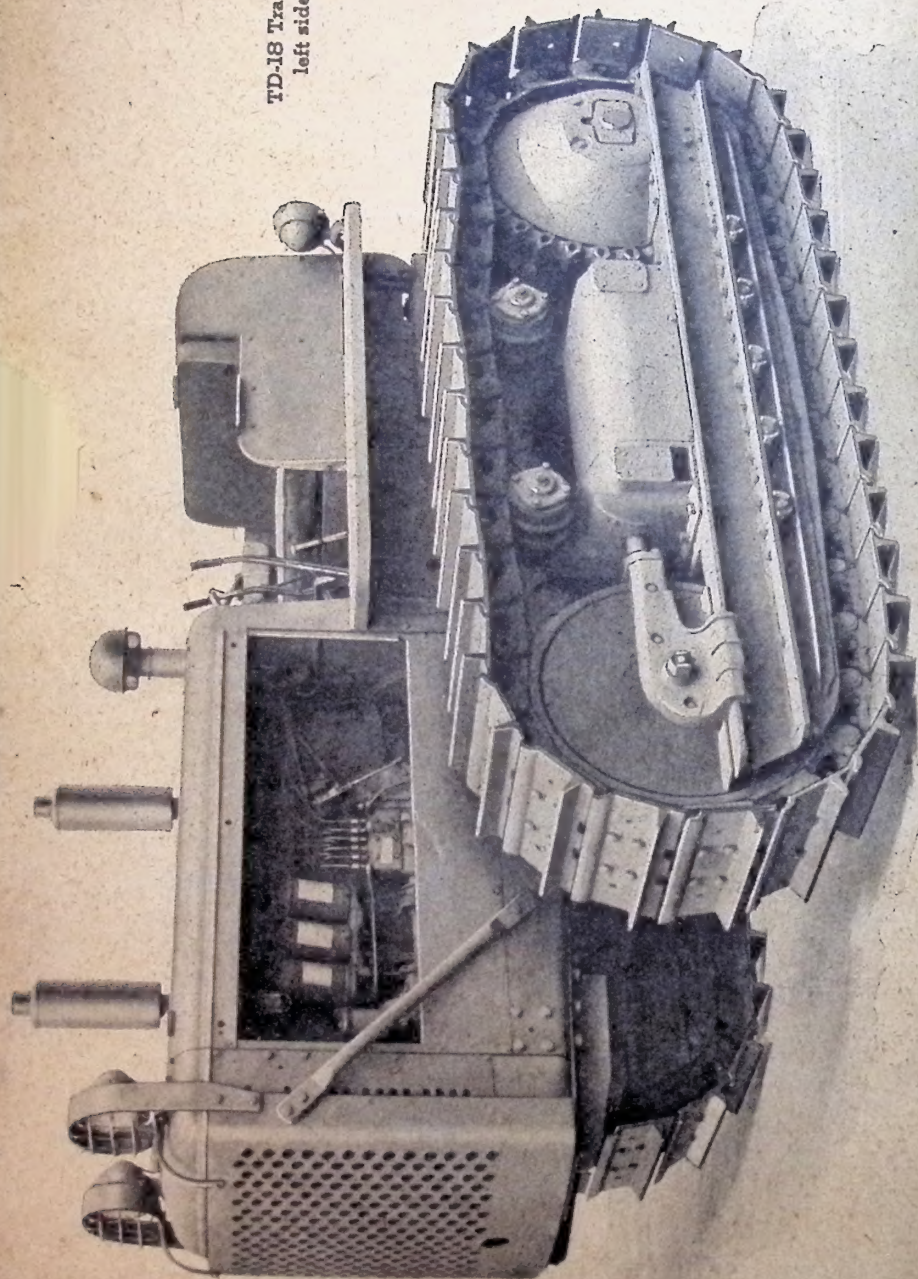
LUBRICATION

8

TRACKS

9

TD-18 TracTracTor,
left side view.



OPERATIONS SECTION

SPECIFICATIONS

CAPACITIES (U.S. Measure)

| | |
|---|-------------|
| Fuel tank | 60 gals. |
| Gasoline tank | 1-1/2 gals. |
| Water cooling system. | 27 gals. |
| Transmission. | 7-1/2 gals. |
| Sprocket drive cases (each side). | 5 qts. |
| Crankcase pan | 22 qts. |
| Injection pump (Bosch). | 3/8 pt. |
| Air cleaner oil cup | 6-3/4 pts. |

ENGINE (DIESEL TYPE) (45° Head)

| | |
|---|----------------------|
| Cylinders | 6 |
| Bore | 4-3/4 in. |
| Stroke. | 6-1/2 in. |
| Engine speed (governed) | 1200 R.P.M. |
| Fuel injection pump | Bosch |
| Carburetor - IHC Type "C-12" (updraft). | 1-1/4 in. |
| Magneto with impulse coupling | IHC Type F-6 |
| Battery (two) | 17 plate |
| Spark plug gap. | .035 in. to .040 in. |
| Valve clearance (engine hot). | .018 in. |

ENGINE CLUTCH

| | |
|---|--------|
| Over-center type (hand-controlled). | 17 in. |
|---|--------|

STEERING CLUTCH

| | |
|---|--------|
| Multiple dry disc - spring-loaded type with manual release. | 15 in. |
|---|--------|

BRAKES

| | |
|---|--------|
| External contracting on steering clutch drums | 17 in. |
|---|--------|

TRACK

| | |
|---|------------|
| Tread (standard). | 62 in. |
| Tread (wide tread). | 74 in. |
| Ground contact length (normal). | 84-5/8 in. |
| Track shoe width | 20 in. |

TRANSMISSION

| | | |
|--|-----------------------|-------|
| Six speeds forward - M.P.H. Two speeds reverse - M.P.H. | Low | 1-1/2 |
| | Second. | 2 |
| | Third | 2-1/2 |
| | Fourth. | 3-3/8 |
| | Fifth | 4-5/8 |
| | High. | 5-3/4 |
| | Low-Reverse | 1-1/2 |
| | Hi-Reverse. | 3-3/8 |

GENERAL OVER-ALL DIMENSIONS

| | |
|---|-------------|
| Length (overall) | 160-1/8 in. |
| Width (overall) (standard tread). | 82-1/4 in. |
| Width (overall) (wide tread). | 94-1/4 in. |
| Height - tip of grouser to top of exhaust muffler | 93-7/8 in. |
| Drawbar height (above ground line). | 15-3/8 in. |
| Drawbar horizontal adjustment | 31-1/4 in. |

OPERATIONS SECTION

DIESEL FUEL SPECIFICATIONS

Do not use dirty fuel.

Diesel fuel for high-speed automotive-type Diesel engines.

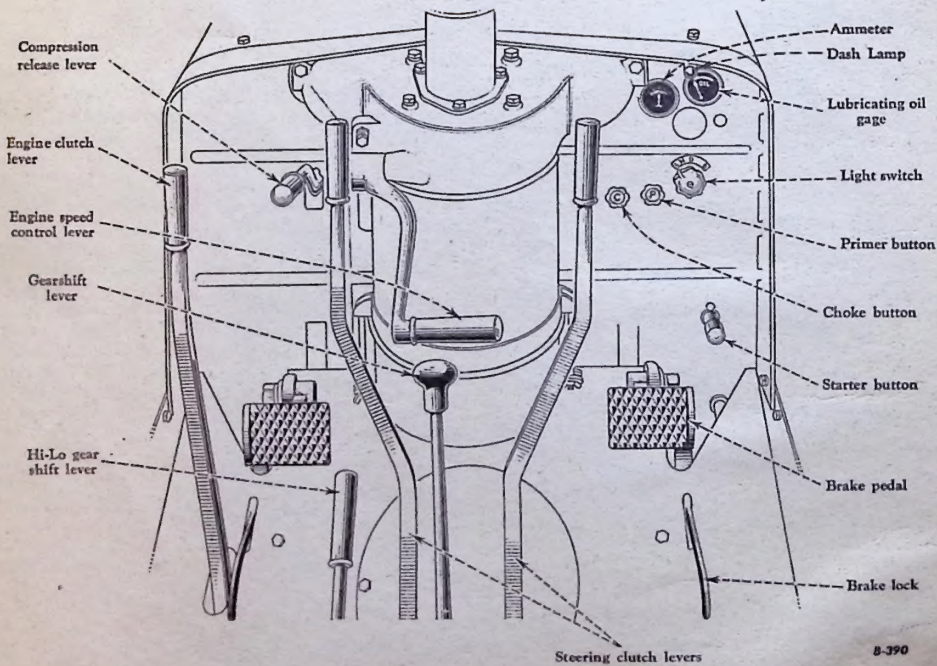
NOTE: Pour point must be lower than minimum temperature at which fuel is to be used.

GRADE:

Class A

Class B

Class X (Winter grade)



Illustr. 1 - Operating Controls.

OPERATIONS SECTION

INSTRUMENTS AND CONTROLS

COMPRESSION RELEASE LEVER

Pulling down on the compression release lever converts the Diesel into a gasoline engine for starting. Reduced compression, spark-plug ignition, and carbureted gasoline fuel permit starting the engine as a gasoline engine. After a quick cylinder warmup, switch the engine to Diesel operation by pushing the compression release lever all the way up. Refer to page 6 for correct method of starting on gasoline and changing to Diesel operation. See page 8 for changing back to gasoline operation before stopping engine, and then place compression release lever back in Diesel position after engine is stopped.

ELECTRIC STARTER BUTTON

Pressing on this button with the foot completes the electrical circuit between the battery and the starting motor and causes the starting motor pinion to engage the flywheel ring gear, thereby cranking the engine. Stop pressing the button the moment the engine starts. Do not run the starting motor for more than 30 seconds at any one time.

CHOKE BUTTON

Helps start the engine when the engine is cold. Pulling out the rod shuts off air to the carburetor, enriching the mixture. After the first few revolutions of the engine, push the choke button in half way, or to a point where the engine runs without missing. Push the choke all the way in after the engine has started. Do not run the engine with the choke rod out.

PRIMER BUTTON

When starting in cold weather the engine should be primed. A few strokes of the primer button, which sprays raw gasoline directly into the intake manifold, are usually

sufficient. The number of strokes will depend on the operating temperature.

LIGHT SWITCH

Controls the battery charging rate. In its regular position at "L" it is set for low charging. Turn to the first position at the right, "H", for high charging rate, to second position "D" for dim lights, and to position "B" for bright lights. (Also see page 2, Section 5.)

AMMETER

This is the check on the electrical system. It indicates whether the battery is being charged or discharged. When the engine is operating, the needle should be in the "Charge" range. If the ammeter shows discharge continuously, the cause should be investigated to avoid completely "running down" the battery.

LUBRICATING OIL GAGE

Indicates the pounds of pressure of the oil circulating through the engine. The indicator needle should be in the white area when the engine is running. If the indicator is not in the white area, stop the engine immediately and investigate the cause of the oil pressure failure. (Notify proper maintenance personnel.)

ENGINE SPEED CONTROL LEVER

Controls the speed of the engine, and, when set in a given position, maintains a uniform engine speed under variable loads.

ENGINE CLUTCH LEVER

Is used to disengage the engine from the transmission. Push the engine clutch lever all the way forward to disengage the engine clutch.

OPERATIONS SECTION

INSTRUMENT AND CONTROLS - Continued

GEARSHIFT LEVER

Is used to select the various gear ratios provided in the transmission. There are three forward positions and one reverse position, a total of six forward speeds and two reverse by using the high and low range gearshift lever.

HI-LO GEARSHIFT LEVER

Is used to double the range of speeds. Moving the lever forward gives the low range, and backward the high range.

STEERING CLUTCH LEVERS

Are used to steer the tractor. Pulling back on either steering lever releases the steering clutch

and makes the track on that side inoperative. To turn left, pull on left lever and to turn right, pull on right lever.

STEERING BRAKE FOOT PEDALS

Operating the steering brakes helps in turning the tractor. Never apply the steering brake until the steering clutch is fully released. Do not use the brake unless it is necessary to make a sharp turn.

STEERING BRAKE LOCKS

Each steering brake pedal has a locking device to hold the tractor whenever necessary. To lock either brake, push foot brake pedal down and lift up ratchet pawl, which engages in the ratchet, locking the brake pedal.

BEFORE STARTING A NEW TRACTOR

Make a complete inspection of tractor for any shortage or damage which may have occurred while being shipped.

LUBRICATION

(1) Lubricate the entire tractor, using the "Lubrication Guide."

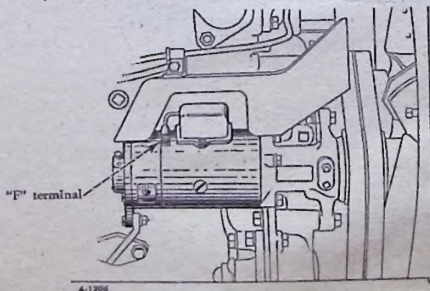
(2) Check the oil levels of the engine crankcase, air cleaner, transmission case and sprocket drive gear cases to see that they are filled to the correct levels with the proper grades of oil for the prevailing temperature. (Refer to specifications of lubricants in the "Lubrication Guide.")

(3) Tractors shipped to destinations in the United States of America, Canada, and Mexico are filled with oil in all parts before leaving the factory. However, the lubricant compartments should be checked for proper levels as outlined in item 2 above.

TRACTORS PACKED FOR EXPORT

All oil is drained from the engine crankcase, air cleaner, and from all the gear cases of tractors packed for export.

(4) Engines shipped to destinations in the United States of America, Canada and Mexico are filled with thinned SAE-10 oil when leaving the factory. For further information, refer to "Lubrication Guide."



Illustr. 2
Showing "F" Terminal or Generator

OPERATIONS SECTION

BEFORE STARTING A NEW TRACTOR - Continued

ENGINE COOLING SYSTEM

Be sure radiator is filled with clean water. (Use soft or rain water if possible.) For further information refer to "Cooling System", page 1, Section 4.

If the tractor is to be operated in freezing temperatures (32° F. or lower) refer to "Cold Weather Operations" on page 11.

ELECTRICAL SYSTEM

Tractors are shipped with braided ground strap disconnected at battery end. In addition the connection at the "F" terminal on the generator is not completed. Do not operate the tractor until battery ground cable is connected and generator wire has been connected at "F" terminal. (See *Illust. 2.*)

Batteries when shipped dry should be serviced as outlined on instruction tag attached to the battery.

PREPARING TRACTOR FOR DAILY OPERATION

(1) FUEL SYSTEM

(See *Illusts. 3 and 4*)

Fill the main fuel tank (capacity 60 gallons, U.S.). For fuel specifications refer to page 2. Fill the gasoline tank with a good grade of clean gasoline (capacity is approximately 1-1/2 gallons, U.S.).

Carefully strain the gasoline and the Diesel fuel to be sure they are free from foreign substances. Do not use dirty fuel.

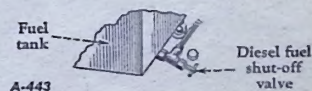
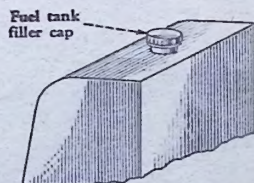
Exercise extreme care when filling fuel tanks from drums or similar containers. Do not take the last 4 inches because water may be in the bottom of the container. This remainder can be accumulated in several containers, poured into one container, and allowed to settle. The fuel can be pumped out down to the last 4 inches.

(2) COOLING SYSTEM

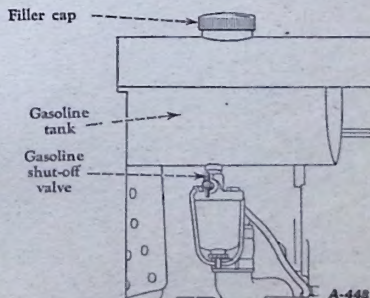
Remove the radiator cap and check to see that water is up to a level slightly below bottom of filler opening. If the system has been drained see instructions on page 1 of Section 4.

(3) LUBRICATION

Check for any leakage from lubricant compartments. Be sure oil in crankcase is up to full level mark on oil gage. Refer to "Lubrication Guide" for complete lubrication requirements.



Illust. 3 -- Showing the Fuel Oil Tank and Shut-off Valve.



Illust. 4 -- Showing the Gasoline Tank and Shut-Off Valve.

OPERATIONS SECTION

OPERATING THE DIESEL ENGINE

Four steps are necessary in operating this diesel engine.

- (1) Starting engine on gasoline.
- (2) Changing over to Diesel.
- (3) Changing back to gasoline before stopping engine -- to facilitate next starting.
- (4) Putting compression release lever in diesel position after stopping the engine on gasoline -- to permit starting valves to cool on their seats.

The above steps are fully explained in the following pages.

TO START THE ENGINE

(See *Illust. 1 - Operating Controls*)

(See *Illust. 5 - Engine Controls*)

1) Place the gear shift lever in neutral position and disengage the engine clutch by pushing lever all the way forward.

(2) Pull the compression release lever down to starting position.

(3) Pull the engine speed control lever back to starting position and leave in this position until the engine is changed to Diesel operation.

(4) Pull choke button out part way. (In cold weather pull out all the way). Give the primer button several strokes in cold weather if necessary.

(5) Step on starter button.

(6) Push choke button in to where the engine runs without missing and gradually push all the way in.

(7) Check the engine oil pressure. If the gage does not indicate any pressure, stop the engine and inspect the oil system to find the cause of the failure.

(8) Engine is now running on gasoline cycle and should operate for about a minute (2 or 3 minutes in cold weather) before switching to diesel fuel).

NOTE: If trouble is experienced in starting the engine refer to page 10, "Operating Precautions". Also see "Cold Weather Operation", page 11.

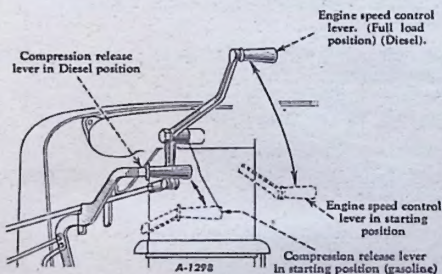
TO CHANGE TO DIESEL OPERATION

(See *Illust. 5 - Engine Controls*)

(1) Push the compression release lever all the way forward.

(2) Immediately advance engine speed control lever far enough to keep engine from stalling.

NOTE: The carburetor and magneto are cut out and auxiliary combustion chamber is closed, isolating the spark plugs when compression release lever is put in the "Diesel position".



Illust. 5 - Engine Controls.

TO HAND CRANK THE ENGINE (IF NECESSARY)

If it is necessary to crank engine with hand crank, assemble crank adapter in coupling in place of power take-off shaft.

(1) Pull the choke out all the way.

(2) Crank with two or three half up-strokes.

(3) Then push choke three-quarters of the way in and crank with half up-strokes until engine starts.

OPERATIONS SECTION

OPERATING THE TRACTOR

SAFETY FIRST!

Before dismounting from the tractor put the gear shift lever in neutral position.

Read and observe "Operating Precautions" on page 10.

After the tractor is in motion extreme care should be taken to

prevent accidents and personal injuries.

Before attempting to drive the tractor the driver should be thoroughly familiar with all of the instruments and controls. See page 3 for description of all the instruments and controls.

DRIVING THE TRACTOR

(See Illust. 1)

When the engine has been running long enough to warm up, set the engine speed control lever in the idling position (lever slightly up from lowest position). Disengage the engine clutch by pushing the engine clutch control lever (on left hand side) forward as far as it will go. Continue to press forward on the clutch lever to apply the clutch brake until the clutch stops turning, then carefully move the gear shift lever to the speed desired.

After putting the transmission gears in mesh, advance the engine speed (by raising engine speed control lever) enough to keep the engine from stalling, and carefully engage the engine clutch until the slack is taken up between the tractor and the load, then pull the clutch lever back until full over-center cam engagement is definitely felt.

ON A NEW TRACTOR - Do not operate a new tractor immediately on a

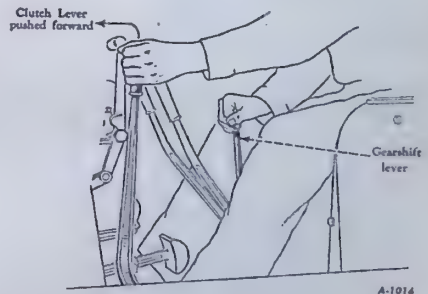
full load; run light for a reasonable length of time.

Do not overload the tractor at any time.

GEAR SHIFTING

CAUTION! DO NOT SHIFT GEARS WHILE TRACTOR IS IN MOTION.

Always disengage the clutch before shifting gears. (See above paragraph).



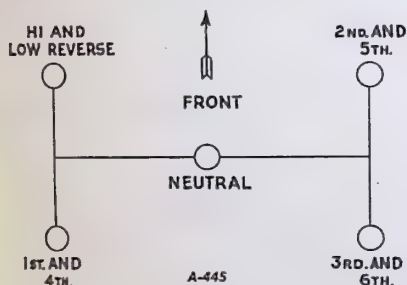
A-1014

Illust. 6
Disengaging Engine Clutch
to Shift Gears.

OPERATIONS SECTION

OPERATING THE TRACTOR - Continued

There are three forward positions and one reverse position in the transmission giving six forward speeds and two reverse speeds by using the high and low range gear shift lever. Once a speed has been selected and the tractor is in operation, further gear shifting should not be attempted until clutch is completely disengaged and the tractor is stopped.



Illust. 7
Showing the Various Gear
Shifting Positions.

HI-LO RANGE

The high and low range of the transmission is controlled by the Hi-Lo gear shift lever (See Illust. 8). Moving this lever forward gives a low range, and backward a high range.

When the Hi-Lo lever is in the "down" position (forward), the tractor can be shifted with transmission gear shift lever to low-reverse, first, second, or third speeds. When the Hi-Lo lever is in the "up" position (backward), the tractor can be shifted to high-reverse, fourth, fifth, or sixth speeds.

TO STOP TRACTOR

Disengage the clutch by pushing the clutch lever forward and move

the gear shifting lever to neutral position. Use the brakes if necessary.

SAFETY FIRST! Put the gear shift lever in neutral position.

TO STOP ENGINE

- (1) Make sure gasoline supply is turned on.
- (2) Retard the engine speed control lever and at the same time pull the compression release lever all the way back (to gasoline position).
- (3) Shut off the gasoline fuel supply at the tank and allow the engine to use up the fuel in the carburetor.
- (4) After engine stops on gasoline, push the compression release lever up to "Diesel" position to permit the starting valves to cool on their seats.



Illust. 8
Hi-Lo Range Shifting Lever
Up (Backward) Position
Hi-Range
Down (Forward) Position
Lo-Range

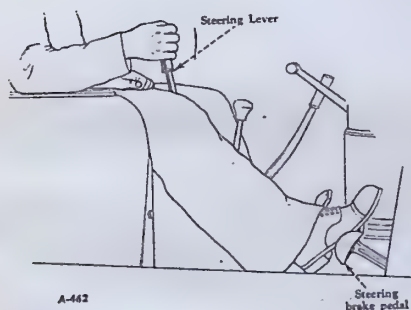
OPERATIONS SECTION

STEERING THE TRACTOR

(1) Turn to the right or left by pulling back the steering clutch lever on the side to which the turn is to be made.

(2) To make a sharp turn, use the steering brake on the side toward which the turn is to be made. For example: To turn sharply to the right, pull back on the right hand steering clutch lever and then push down on the right steering brake pedal.

(3) If pulling back on the steering clutch lever does not turn the tractor enough, and if pushing the steering brake all the way down turns the tractor too much, press down gently on the steering brake pedal until the desired turn is made.



Illust. 9
Turning to the right.

STEERING DOWN GRADE

(1) When going down grade with the tractor pulling the load, steering should be done in the usual manner.

(2) When going down grade, if the load is pushing the tractor, the steering clutch operation is reversed. Disengage the right steering clutch to turn left, and the left steering clutch to turn right. Do not apply the brakes.

OPERATING OVER AN OBSTRUCTION

When running over a log or ditch bank, use the steering clutches instead of the engine clutch to slow the tractor. Both steering clutches may be released slightly until the tractor balances on the top of the obstruction. Then, engage one clutch gradually so the tractor moves forward at an angle, over and down. If load is light, it might be necessary to use the brakes.

STEERING BRAKE LOCKS

Each foot brake pedal is provided with a locking lever device. To lock either brake, push the foot brake pedal down and lift up the ratchet pawl (see Illust. 1). This engages the pawl in the ratchet (see Illust. 1, Section 1) and locks the brake pedal.

Do not use the brake pedals as foot rests; this causes undue wear on the brake parts.

OPERATIONS SECTION

OPERATING PRECAUTIONS

(1) Do not attempt to start the engine by towing or coasting the tractor. To do so may cause serious damage to the engine and transmission.

(2) Do not run starting motor for more than approximately 30 seconds at any one time.

(3) If trouble is experienced in starting on gasoline in cold or damp weather, the spark plugs should be removed and wiped off, removing any condensation. At the same time check the spark plug gap which should be .035" to .040" after drying the spark plugs. Replace them in the engine and start as usual.

(4) If it is necessary to hand crank the engine, the operator should stand in a position that will eliminate any possibility of being struck by the starting crank if there is a reversal of the direction of the engine. Crank the engine by using quick up-strokes; do not spin it.

(5) **SAFETY FIRST!** Never fill the gasoline tank when lamps are lighted, when near an open flame, or when the engine is running. Keep the funnel, used for pouring in the fuel, in contact with the metal of the tank. By so doing,

you will avoid the possibility of an electric spark igniting the gas. Do not light matches near gasoline as the air within a radius of several feet is permeated with a highly explosive vapor.

See that the vent holes in the fuel and gasoline tank filler caps are kept open at all times to assure proper flow of the fuel.

(6) Do not pour cold water into the radiator if engine is very hot unless conditions make it absolutely necessary. Under such conditions, start the engine and let it idle while slowly pouring water into the radiator.

(7) Do not apply the steering brake until the steering clutch is fully released as excessive heating and rapid wear of steering brakes will result.

When pulling a load, it is not necessary to use the steering brakes except to make sharp turns; the load itself acts as a brake. Do not use the brakes unless it is necessary to do so in order to make the required turn.

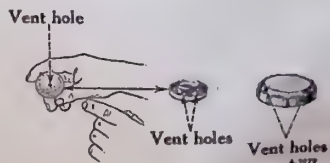
(8) Do not ride the brake pedals, as this will result in excessive wear on brake linings.

(9) Improper use of the steering brakes when making turns will cause the tractor to jerk. Try to avoid this by using the steering



A-4084 A

Illustr. 10
Showing correct method of
Pouring Gasoline into Tank.



Illustr. 11
Showing Air Vent Holes in Gasoline and Fuel Tank Caps.

OPERATIONS SECTION

OPERATING PRECAUTIONS - Continued

control lever intermittently with only a slight pressure on brake pedal when making any turn except a pivot turn. This method of turning gives you a more even turn and does not subject the tractor to sudden impacts.

(10) The drawbar should be free to swing at all times unless it is absolutely necessary to hold it in one position.

(11) Do not shift gears while tractor is in motion.

(12) Immediately after engine starts, check the oil pressure indicator to see if it is registering pressure. If it is not, stop engine and inspect oil system to find the cause of failure. If unable to find cause, be sure to notify the proper maintenance personnel before operating engine.



Illustr. 12
Oil Pressure Indicator.

(13) If tractor is equipped with power take-off, stop power take-off before dismounting from tractor.

(14) Be sure to replace lubricating oil filter elements, and clean air cleaner at regular intervals as specified.

COLD WEATHER OPERATION

If the tractor is to be operated in temperatures of 32° F. or lower, observe the following precautions:

FUEL SYSTEM

Use only a high-test winter-grade gasoline for starting. Keep the supply in a closed container so the more volatile portion does not evaporate.

Fill the fuel tank at the end of the day's run to prevent moisture from collecting in the tank.

Never allow the fuel to get lower than 2 inches from bottom of the fuel tank.

STARTING THE ENGINE

Prime the engine with gasoline using 4 or 5 strokes of the primer. The number of strokes will depend on the temperature.

If the tractor is equipped with a radiator shutter and heat indicator, close shutter when starting; then regulate it as required to hold the needle of the heat indicator in the high side of the "RUN" range.

LUBRICATION

Be sure to use the correct grade of lubricant in the engine crankcase, injection pump, air cleaner, magneto impulse coupling, transmission, track rollers, track idlers and sprocket drive gear case as specified in the "Lubrication Guide."

TRACKS FROZEN TO GROUND

If the tractor is left out during cold weather and the tracks become frozen to the ground loosen the tracks before starting the tractor.

OPERATIONS SECTION

COLD WEATHER OPERATION - Continued

Do not attempt to jerk them loose with the power of the engine because the sudden impact, if the tracks should not break loose, may damage the tractor.

OPERATING IN WATER OR SNOW

When operating the tractor in deep water, or in snow that is in a thawing condition, lubricate the track rollers every four hours. This will flush out the water that might be forced past the seals and into the lubricant. If operating the tractor in water that is deep enough to submerge the bottom of the transmission case, inspect the lubricant in the transmission case and in the drive gear sprocket cases frequently. If any water is present, drain these cases and refill with new oil.

NOTE: When operating the tractor in water, or under extremely dusty conditions, water or dust might come in through the holes in the drain plugs on the engine clutch and steering clutch compartments. To avoid this take out these drain plugs and replace them with solid plugs which have no holes. Occasionally remove the plugs to allow any oil accumulation to drain out.

COOLING SYSTEM

When the temperature is likely to be 32° F. or lower, there is danger of the water freezing in the cooling system. To overcome this, either drain the water from the cooling system at the end of each run, or use the recommended anti-freezing solution.

IMPORTANT! Before filling the radiator in freezing weather, cover the entire radiator and start the engine; then put in the water immediately. This prevents the water from freezing during the warming up period.

TO DRAIN THE SYSTEM

- (1) Open the radiator drain cock on the lower right-hand side of the radiator, below the fan idler pulley. (See *Illust. 2, Section 4.*)
- (2) Open the drain cock in the right-hand side of the crankcase. (See *Illust. 2, Section 4.*)
- (3) Check to see that the drain cocks are not clogged and that the water drains completely.

ANTI-FREEZE SOLUTIONS

The table shown below gives the quantities of anti-freeze to be added per gallon of water. To determine the total quantity necessary, multiply the capacity of the cooling system (27 gallons, U.S.) by the number of pints per gallon required at the prevailing temperature.

CAUTION! Do not mix anti-freeze solutions.

Do not under any circumstances use any of the following in the cooling water as an anti-freeze.

Honey, salt, kerosene, Diesel fuel, glucose or sugar, calcium chloride or any alkaline solution.

| Freezing Point (Fahrenheit) | Ethylene Glycol |
|--------------------------------|-----------------------------|
| | (Pints Required Per Gallon) |
| 10° | 2 |
| 0° | 2-1/2 |
| -10° | 3 |
| -20° | 3-1/2 |
| -30° | 4 |
| -40° | 4-1/2 |
| -50° | 4-1/2 |
| -60° | 5 |
| -70° | 5 |

OPERATIONS SECTION

PERIODIC INSPECTIONS

To assure mechanical efficiency tractors should be systematically inspected at intervals outline below:

AFTER 8 HOURS OF OPERATION

| Point of Inspection | Remarks |
|------------------------------|-------------------------------|
| Lubrication points | Refer to "Lubrication Guide." |

AFTER 64 HOURS OF OPERATION

| Point of Inspection | Remarks |
|---|--|
| *Air cleaner, complete. | Remove and clean. (Refer to page 2, Section 6.) |
| * - When unusual mud or dust conditions are encountered during operation it may be necessary to service this point more frequently. | |
| Flexible rubber connection between air cleaner and air intake pipe. . | Inspect for loose fit or damage. (Refer to page 3, Section 6.) |
| Diesel fuel water trap | Take apart and clean. (Refer to page 1, Section 7.) |
| Fan belts. | Check tension; replace when necessary. (Refer to page 2, Section 4.) |
| Radiator fins. | Clean spaces. (Refer to page 2, Section 4.) |
| Battery liquid | Check amount and specific gravity. (Refer to page 1, Section 5.) |
| Battery terminals. | Clean and grease. (Refer to page 2, Section 5.) |
| Steering clutch housing drain plugs. | Remove plugs and drain oil accumulation. (Refer to "Lubrication Guide.") |
| Tracks | Check slack. (Refer to page 1, Section 9.) |
| Lubrication points | Refer to "Lubrication Guide." |

AFTER 128 HOURS OF OPERATION

| Point of Inspection | Remarks |
|----------------------------------|---|
| Lubricating oil filters. | Replace filter elements. ((Refer to page 3, Section 6.) |
| Engine crankcase | Drain and change oil. (Refer to "Lubrication Guide.") |
| Generator commutator | Clean. (Refer to page 2, Section 5.) |
| Lubrication points | Refer to "Lubrication Guide." |
| Diesel fuel filter | Clean and wash elements. (Refer to page 2, Section 7.) |

OPERATIONS SECTION

PERIODIC INSPECTIONS - Continued

AFTER 256 HOURS OF OPERATION

| Point of Inspection | Remarks |
|--------------------------------------|---|
| Gasoline strainer and sediment bowl. | Take apart and clean. (<i>Refer to page 1, Section 7.</i>) |
| Governor breather on injection pump. | Remove and clean. (<i>Refer to page 6, Section 7.</i>) |
| Spark plugs. | Remove and clean; check gap. (<i>Refer to page 5, Section 5.</i>) |
| Magneto breaker points and chamber . | Clean chamber and check gap. (<i>Refer to page 8, Section 5.</i>) |

AFTER 512 HOURS OF OPERATION

| Point of Inspection. | Remarks |
|--------------------------------------|--|
| Fuel line screen (at carburetor) . . | Remove and clean. (<i>Refer to page 3, Section 7.</i>) |
| Cooling system | Clean. (<i>Refer to page 2, Section 4.</i>) |
| Engine valves. | Check for clearance. (<i>Refer to page 4, Section 6.</i>) |
| Steering clutch hand levers. | Check for free movement at handles. (<i>Refer to page 2, Section 3.</i>) |
| Steering brake pedal | Check for free movement at pedal pad. (<i>Refer to page 1, Section 1.</i>) |
| Lubrication Points | <i>Refer to "Lubrication Guide."</i> |

OPERATIONS SECTION

STORING AND HOUSING DIESEL TRACTORS

When the tractor is not to be used for a period of time, it should be stored in a dry and protected place. To leave equipment outdoors, exposed to the elements, will result in materially shortening its life.

The following procedure should be followed when the tractor is placed in storage for 30 days or more and the lubrication precautions should be repeated every six months thereafter. We also recommend caution to be practiced in starting an engine that has been in storage. (Refer to instructions on the next page.)

(1) Wash or clean and completely lubricate the tractor. (Refer to "Lubrication Guide.")

(2) Drain the lubricating oil from the Diesel injection pump and governor and refill with new oil as specified on "Lubrication Guide."

(3) Close the Diesel fuel shut-off valves, (see Illust. 3), clean water trap and drain Diesel fuel filter. Disconnect Diesel fuel supply line at inlet side of Diesel fuel supply pump. Also disconnect fuel return pipe at injection pump. Connect a suitable tubing to the inlet side of Diesel fuel supply pump and lead the free end of the tubing into a container of flushing oil. Recommended flushing oils are Gulf Oil Corporation No. 301, Shell Latus No. 22 Oil, Formula No. 11326 Standard Oil Company, No. 8504 or E382 Socony Vacuum Oil Company or Capella Oil AA. (In emergencies a flushing oil mixture of 1/2 kerosene and 1/2 good grade of light lubricating oil may be used.)

Start and operate the engine on gasoline until sufficient fuel has been used to assure filling the Diesel fuel filter and flushing the pump. (This will require approximately 2 quarts of flushing mixture to fill filter). (Filling of fuel filter can be determined by opening air bleed on top of fuel filter).

After fuel filter has been filled, engine should continue on gasoline for an additional 5 minutes to assure flushing of internal parts of pump. Then drain flushing oil from fuel filter. Reconnect regular fuel supply line and fuel return pipe to the fuel supply pump.

(4) Drain water from the cooling system.

(5) Oil magneto impulse coupling liberally with the grade of oil specified in the "Lubrication Guide."

(6) Remove spark plugs and put the compression release lever in the gasoline (starting) position. Pour one tablespoonful of SAE-50 lubricating oil of good grade through spark plug opening into each cylinder. Put the compression release lever in the Diesel position.

(7) Remove valve housing cover and spray oil over rocker arm and starting valve assembly. Replace cover.

(8) Cover exhaust pipe with a tin can to prevent moisture from entering manifold.

(9) Remove the oil filter elements. (If any evidence of rust is found on the center stud, clean thoroughly.) Replace filter elements with new ones and drain out any sludge from filter base.

THE ENGINE MUST NOT BE RUN AFTER FLUSHING OPERATION.

OPERATIONS SECTION

BEFORE STARTING DIESEL ENGINES THAT HAVE BEEN IN STORAGE

- (1) Remove the spark plugs and put the compression release lever in the gasoline (starting) position. Pour a mixture of one-half gasoline and one-half engine oil, SAE-10, into each cylinder (two table-spoonfuls per cylinder is sufficient).
 - (2) Remove valve housing cover and flush valve and valve operating mechanism with same mixture.
 - (3) Crank engine rapidly until excess oil has been blown out of spark plug holes. (This operation will loosen any tight piston rings and wash old gummy oil from valves and pistons.)
 - (4) Flush out the impulse coupling with the same grade of oil used for lubrication and lubricate as specified in the "Lubrication Guide."
 - (5) Flush out the crankcase with Diesel fuel; solvent, dry cleaning; or kerosene and fill it with the proper grade of lubricating oil specified in the "Lubrication Guide."
 - (6) Drain the oil from the injection pump and refill to proper level with specified lubricating oil. (Refer to "Lubrication Guide.")
 - (7) Before starting engine be sure filters have new elements.
 - (8) Remove tin can from exhaust pipe.
 - (9) Install spark plugs.
 - (10) Fill cooling system.
 - (11) Fill fuel tanks.
 - (12) Start the engine and let it run slowly. Observe if any valves are sticking. If so, pour a small quantity of Diesel fuel; solvent, dry cleaning; or kerosene on the valve stem until the valves become loose.
 - (13) Assemble valve housing cover.
- CAUTION! Do not accelerate the engine rapidly or operate at high speed immediately after starting.
-

OPERATIONS SECTION

STEERING BRAKES

The steering brakes are 17" external contacting bands on the steering clutch drums.

ADJUSTMENT

(See Illusts. 1 and 2.)

The adjustment for wear is done by turning the brake rod adjusting knobs "A" on each side (located under the dash just above the engine frame side channels) clockwise until the desired pedal travel is obtained.

When adjustment can no longer be made with knobs, turn the knobs counter-clockwise until about 1-inch of the threads are covered. Then remove the brake inspection cover, under the rear section of the main frame on each side of the tractor. Adjust the brake band set screw "E" to give 1/64 of an inch clearance between the steering clutch drum and the lining at that point and lock the set screw. Loosen the jam nut "B" and turn the steering brake band adjusting bolt "C" until 1/64 of an inch

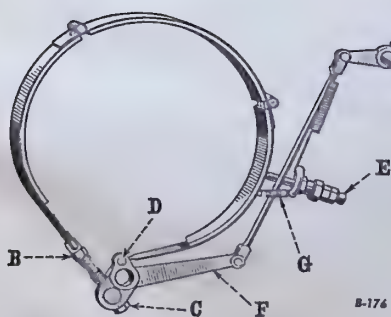
clearance is obtained between the steering clutch drum and the brake lining at all points. Lock the jam nut "B", replace the covers and adjust the knob "A" to give 3-inches free pedal movement.

Subsequent intermediate adjustments can be made with the adjustment knobs "A".

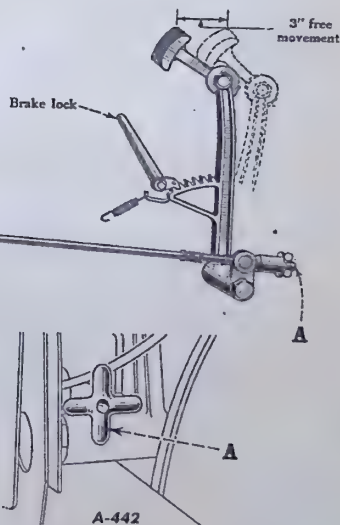
BRAKE LINING RENEWAL

(See Illusts. 1 and 2.)

Release the tension on the adjusting knob "A". Remove the covers from the bottom and the rear of the main frame. Remove the set screw from the brake band pivot shaft and slide the shaft far enough into the main frame so as to remove it from the pivot arm "F". Back up the adjusting set screw "E". Unhook the spring "G" from the brake band. Remove the brake band adjusting bolt "C", pin "D" and pull the brake band from the drum. Reline the bands and replace them by reversing the above procedure; then, adjust as described above.



Illust. 1
Steering Brake Adjustment.



Illust. 2

OPERATIONS SECTION

MEMORANDA

OPERATIONS SECTION

CHASSIS SERVICE OPERATIONS (MINOR)

STEERING CLUTCH COMPARTMENT AND CLUTCH HOUSING DRAINS

NOTE: If operating the tractor in water, under very wet conditions, or under extremely dusty conditions, water or dust might come in through the holes in the drain plugs on the engine clutch and steering clutch compartments. To avoid this, replace these plugs with solid plugs which have no holes.

These solid plugs should be removed after every 64 hours of operation to allow any oil accumulation to drain out.

TRANSMISSION AND SPROCKET DRIVE GEAR CASES

The oil in the transmission case and in the final drive housings should be changed at the interval specified in the "Lubrication Guide."

If the oil in the transmission case and in the final drive housings has been thinned with kerosene for operation in temperatures below Zero, the oil should be changed before the weather becomes hot.

Remove the drain plugs and drain the oil while it is warm. Allow time for complete drainage, then replace the plugs. Refill to the

proper level with approved lubricant. (Refer to "Lubrication Guide.")

TO WASH TRANSMISSION

Fill the transmission case and the sprocket drive gear cases to the proper level with Diesel fuel; solvent, dry cleaning; or kerosene. Operate the tractor in low gear for a few minutes, then remove the drain plugs and allow time for complete drainage. Replace the plugs and fill to the proper levels with fresh lubricant. (Refer to "Lubrication Guide").

REPLACEMENTS OF MAIN FRAME PARTS

When making replacements of parts in the main frame, the old oil should be thoroughly washed out to remove all sediment, etc.; then, refill with new oil. It is important that this be done as foreign matter, such as very fine dirt, etc., will not separate from the old oil by settling.

SETTING BEVEL GEAR DEFLECTION SET SCREWS

Screw in snug (by hand) against highest point of the gear (turn gear to determine this high point) and back off 1/4 turn. If feeler gages are used, .020-inch is the recommended clearance between the set screw and the high point of the gear. Tighten the lock nut after the adjustment has been made.

OPERATIONS SECTION

MEMORANDA

OPERATIONS SECTION

17" CLUTCH (OVER-CENTER TYPE)

CARE OF THE CLUTCH

This over-center clutch is designed so that it requires a minimum of attention. It is important, however, that instructions for lubricating, as given on "Lubrication Guide," are followed.

OPERATION AND ADJUSTMENT

(1) The clutch is fully engaged when the engine clutch hand lever is pulled back all the way to a point where the full over-centered engagement is definitely felt.

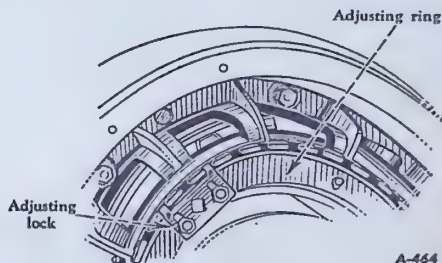
(2) The clutch should be adjusted when there is a noticeable slippage while the tractor is operating under load.

TO ADJUST

(A) Remove the clutch inspection cover, which is located on the floor plate ahead of the steering clutch levers.

(B) Loosen the nuts on the adjusting ring lock and disengage the lock from the notches in the back plate.

(C) With clutch hand lever in disengaged position, turn the adjusting ring in a clockwise direction, moving it one notch, or possibly two notches at the most at any one time. Engage the ring lock in the lock plate. Pull the hand lever back to engaged position as a check to determine if over-center engagement is felt.



Illust. 1
Adjustment of the
over-center clutch.

If adjustment has been made as described, and the cams are so tight that the full over-center engagement is not definitely felt, the adjusting ring should be backed off one notch (in counterclockwise direction).

For satisfactory operation of the clutch do not have clutch adjusted so tight that this full over-center engagement is not easily secured.

The clutch is correctly adjusted when a considerable (not excessive) pressure can be felt when the clutch hand operating lever is pulled back to the engaged position and a definite over-center cam engagement can be felt.

If little or no pressure on end of hand lever is required to engage the clutch, then further adjustment, as outlined above, is necessary.

After the clutch has been correctly adjusted be sure to tighten the nuts on the adjusting ring lock, and then replace the cover plate.

STEERING CLUTCHES

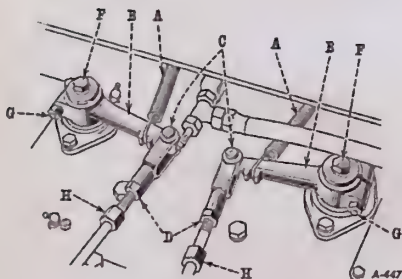
If the steering clutch slips, or if the steering clutch hand lever free movement is less than 2" measured at the handle of the lever), adjustment is necessary.

TO ADJUST (See Illusts. 2 and 3.)

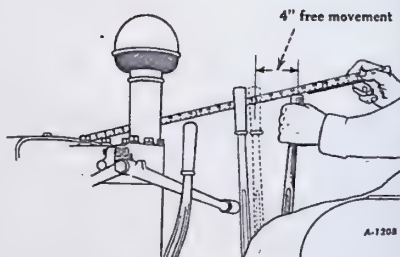
Loosen the yoke lock nuts "D" and the rod by turning nut "H" so as to lengthen the rod. Then tighten the lock nuts "D" against the rods.

Check to see if the free movement of hand lever is 4".

When adjustment can no longer be made by means of lengthening the operating rod, remove the release lever return spring "A" and the operating rod yoke pin "C"; then remove the steering clutch release



Illust. 2
Steering Clutch Adjustment.



Illust. 3
Adjustment of Steering
Clutch Levers.

lever cap screw "F". Loosen the cap screws "G" and pry the release lever off the splined release shaft and turn the right hand release lever clockwise (left hand release lever counter-clockwise) slightly, and replace the lever on the splined release shaft. Then loosen the lock nut and adjust the operating rod until a free movement of 4" is obtained.

When the desired free movement of the hand lever is obtained, replace and tighten the release lever cap screw "F" and tighten the cap screws "G".

Subsequent intermediate adjustments can be made by means of lengthening rod linkage as described above.

OPERATIONS SECTION

COOLING SYSTEM

The water is circulated through the engine blocks, cylinder head, and radiator by a centrifugal pump. The temperature of the water is controlled by a thermostat which will not allow the water to flow through the radiator until the engine has reached operating temperature. When the thermostat is closed the water circulates through the engine only.

very hot, unless conditions make it absolutely necessary, in which case, start the engine and let it idle, then slowly pour the water into the radiator.

(5) If the engine is to be operated in freezing temperatures, refer to "COLD WEATHER OPERATION" on page 12, Section G.

TO FILL COOLING SYSTEM

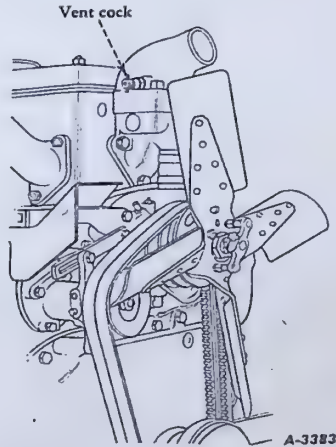
The water capacity of this tractor is approximately 27 gallons (U.S.).

(1) Close the crankcase and radiator drain cocks (see *Illust. 2*).

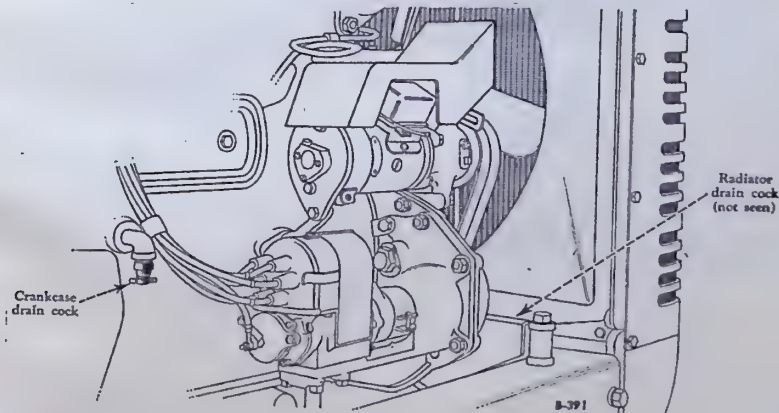
(2) Open the vent cock in the thermostat housing (see *Illust. 1*).

(3) Pour water (soft or rain water, if available) into the radiator until water flows from vent cock. Then close the cock and fill the radiator to a level slightly below bottom of filler opening. This allows for expansion of the coolant under normal operating conditions.

(4) Do not pour cold water into the radiator if the engine is



Illust. 1
Showing Thermostat Housing
Vent Cock



Illust. 2

OPERATIONS SECTION

COOLING SYSTEM

TO CLEAN OUT DIRT AND SLUDGE

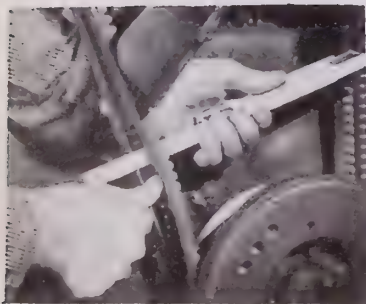
(1) Drain the cooling system by opening the radiator drain cock and crankcase drain cock. Allow the system to drain and close the drain cocks. (See *Illust. 2.*)

(2) Fill the cooling system with a solution of 7 to 8 pounds of ordinary washing soda, mixed with 27 gallons (U.S.) of water (cooling system capacity).

(3) Leave the radiator filler cap off and run the engine until the water is hot, then drain and flush with clean water.

RADIATOR CORE

Overheating is often caused by bent or clogged radiator fins. If the spaces between radiator fins become clogged, clean them with an air or water hose. When straightening bent fins be careful so as to not injure the tubes, or break the bond between the fins and the tubes.

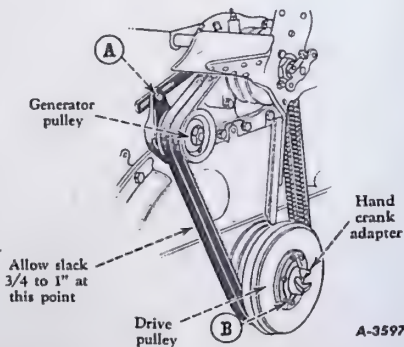


A-987-B

Illust. 3
Checking the Fan Belt Tension.

FAN BELT TENSION

The slack of the fan belts should be checked frequently to assure maintenance of the correct tension. The tension is correct when the belts can be depressed without effort by the thumb, approximately $\frac{3}{4}$ to 1-inch midway between the generator and drive pulleys as shown in *Illusts. 3 and 4.* If the slack is more than 1-inch, adjust belt as follows:



Illust. 4
Adjusting Fan Belt.

TO ADJUST FAN BELTS

To adjust, loosen the nut "A" on generator pulley bracket (see *Illust. 4*). After adjusting belts to correct tension, tighten nut.

Also check to see that the other nuts which hold the bracket in place are tight.

After a new belt has been run approximately 64 hours, check the tension and adjust if necessary.

Having "V" belts tighter than the specified tension results in rapid wear.

OPERATIONS SECTION

COOLING SYSTEM - Continued

REMOVING THE FAN BELTS

To remove the fan belts, loosen nut "A" (see *Illust. 4*) and slack the belts by moving the generator bracket. Slip the belts over the fan pulley and blades, slip them over the drive pulley, and then disassemble the hand crank adapter by removing six nuts at "B".

NOTE: If the tractor is equipped with a front power take-off, it will be necessary to remove the power take-off shaft, which replaces the hand crank adapter.

REPLACING THE FAN BELTS

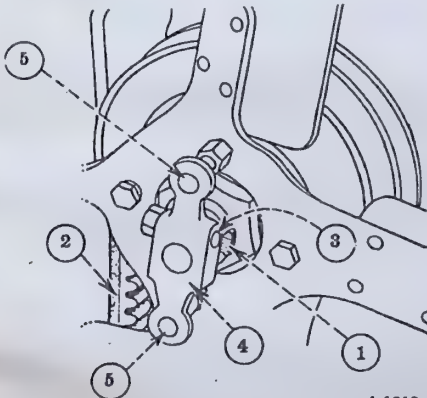
Reverse the procedure outlined under "Removing the Fan Belts". Adjust the tension of the belts as shown in *Illusts. 3 and 4*, and tighten the nut "A".

New belts should be installed in pairs when the old ones become soaked with grease, or so badly worn that they do not drive the fan at the proper speed.

WATER PUMP PACKING

The pump may leak due to wear after considerable service. If this occurs, tighten the packing nut (1) (see *Illust. 5*) just enough to stop the leaking.

To install new packing remove driver pin (3) and driver (4). Unscrew and remove packing nut (1) and place new water pump packing around shaft. Then reassemble the packing nut, driver, and driver pin.



4-1210

Illust. 5

- (1) Water pump packing nut.
- (2) Fan belt.
- (3) Driver pin.
- (4) Driver.
- (5) Stud.

OPERATIONS SECTION

MEMORANDA

OPERATIONS SECTION

ELECTRICAL EQUIPMENT

WIRING DIAGRAM

The wiring diagram, which is shown in the *Electrical Section of the Spare Parts Catalog*, can be used as a guide in identifying the various electrical units, and for tracing the electrical cables and connections.

PRECAUTIONS:

CAUTION! Before working on any part of the electrical system, disconnect the battery ground cable. Do not reconnect this cable until all the other equipment has been connected. This will avoid shorting and causing damage to any of the electrical units.

NOTE: Do not run generator until battery charging circuit, and the lead from the "A" terminal to the "GEN" terminal are connected.

DANGER! The generator will burn out if operated with any wires of the charging circuit disconnected or broken. If it is necessary to operate the generator without the battery, remove the connection from the "GEN" terminal on the relay and ground it on the relay mounting screw, or remove the generator field cable from the "F" terminal on generator frame.

Be sure all the terminals are clean and securely fastened. Make sure there are no broken wires anywhere in the electrical circuit.

Tractors shipped with electrical attachments have the battery ground cable disconnected at the battery end, and in addition, the connection at the "F" terminal on the generator frame is not completed.

Before starting the tractor, connect the "battery to ground" cable and the generator wires.

STORAGE BATTERIES

CARE OF BATTERIES

To prevent failure of batteries it is important that the electrolyte in the batteries be kept at the proper level at all times.

Keep the vent hole in the battery filler caps open.

Inspect the battery once a week or oftener to keep the water at the correct level and to maintain the correct specific gravity. The specific gravity reading of about 1.250, corrected to 80° F. should be maintained. (See Chart "VARIATION OF SPECIFIC GRAVITY WITH TEMPERATURE" on page 4.)

CAUTION: If water is added to the battery when the temperature is near the freezing point (32° F.) always run the engine long enough to mix the water and the electrolyte so the water in the battery will not freeze.

Acid or electrolyte should never be added except by a skilled battery man. Under no circumstances add any special battery "dopes," solutions or powders.

The electrolyte in each cell should be 3/8-inch above the separators. When the electrolyte is below this level, pure distilled water should be added. Never use hydrant water, or any water which has been in a metal receptacle. Keep a glass jar of pure distilled water on hand for battery use only. Use a clean syringe to put the water into the battery cell.

OPERATIONS SECTION

ELECTRICAL EQUIPMENT - Continued

The battery cable terminals must be clean and tight. Use hot water to remove any terminal corrosion, and also for cleaning the top of the battery. Brighten the terminal contact surfaces with wire wool, apply a light coat of vaseline, and reassemble. Be sure the terminals are clamped tightly, and be sure the battery is clamped securely in the battery box. If this is done two or three times a year you should have no trouble from corroded terminals.

Batteries, when shipped dry, should be serviced in accordance with the instructions on the tag attached to the battery.

GENERATOR AND LIGHT SWITCH

The generator has an adjustable third brush for changing the charging rate. It also has a light switch with a field resistance control for regulating the charging rate of the generator from the instrument panel.

The light switch is used to control the generator field resistance and has four positions; Low-Charge, High-Charge, Dim and Bright.

When the lights are turned on to either the dim or bright positions the field circuit is direct to the ground giving high-charge or increased generator output. This is also true when the switch is in the high-charge position.

During the daytime when lights are not used, the switch should be put in the low-charge position. This adds a resistance coil to the field circuit and reduces the output of the generator to approximately one-half its original charge rate. If the charge in the battery is low, the switch should be placed in the high-charge position until the bat-

tery has a full charge as indicated on *Specific Gravity Chart* on page 4.

GENERATOR COMMUTATOR

(See *Illust. 1*)

If the commutator is dirty or slightly burred it can be polished with a strip of No. 00 sandpaper. *Never use emery cloth.*

TO CLEAN COMMUTATOR

The commutator can be cleaned by placing a strip of sandpaper between the brush and the commutator while the armature is revolving. After the polishing operation all dust must be blown from the commutator. If the commutator is very rough or out-of-round it should be referred to the proper maintenance personnel.



A-981-C

Illust. 1

Showing the Method of Cleaning the Commutator by using No. 00 Sandpaper, never use emery cloth.

OPERATIONS SECTION

ELECTRICAL EQUIPMENT - Continued

TO ADJUST CHARGING RATE BY

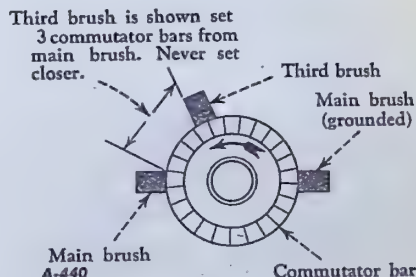
THIRD BRUSH - See Illusts. 2 and 3

Remove the cover band "C" and loosen the round head screw "A" on the commutator end bearing casting until the lock washer tension is released. Do not attempt to remove the screw. Change the charging rate by moving the third brush "B". (this brush is the one mounted on a movable carrier, whereas the other main brushes are mounted directly on the end bearing casting). The rate of charge is increased by moving the third brush in the direction of rotation of the armature and decreased by moving it in the opposite direction.

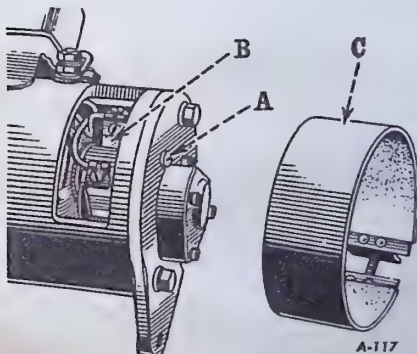
The maximum rate of charge for the generator (with the switch in the high-charge position, and with no electrical load) is 6 to 8 amperes

when "hot" and 8 to 10 amperes when "cold". DO NOT SET BEYOND THESE LIMITS. The battery should be fully charged when checking the maximum generator output.

IMPORTANT! The third brush should never be set closer than three commutator bars from main brush (see Illust. 3).



Illust. 3
View showing Commutator
End (Brush Setting)



Illust. 2
Generator showing Third Brush

When all adjustments are completed be sure to tighten the round head screw "A", which locks the third brush carrier in place. Reassemble the cover band "C" with the joint on the bottom of the generator so that the joint is not over any opening.

CAUTION! All adjustments should be made by proper maintenance personnel.

OPERATIONS SECTION

Variation of Specific Gravity with Temperature Consult This Chart

Read the thermometer in the battery acid—read the Hydrometer—then at the top of the table find the column headed by the temperature which is nearest the battery acid temperature; find, in that column, the figure nearest the observed Specific Gravity reading, and trace horizontally across to the 80° F. column. The 80° F. figures are the true acid gravity and should form the basis for any acid adjustment.

The specific gravity of acid in fully charged batteries should not exceed the value specified by the manufacturer (base temperature 80° F.). If hydrometer readings are taken at acid temperatures other than 80° F., allowance must be made for temperature.

All figures in horizontal lines represent the same state of charge but at the various temperatures shown in the column headings; that is, 1.280 Specific Gravity at 80° F. (the base temperature) becomes 1.268 when Electrolyte temperature is 110° F., and 1.312 when Electrolyte temperature is 0° F.

| 0° F. | 10° F. | 20° F. | 30° F. | 40° F. | 50° F. | 60° F. | 70° F. | 80° F. | 90° F. | 100° F. | 110° F. | 120° F. |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|
| 1.167 | 1.163 | 1.160 | 1.157 | 1.154 | 1.150 | 1.147 | 1.144 | 1.140 | 1.137 | 1.134 | 1.131 | 1.127 |
| 1.177 | 1.174 | 1.170 | 1.167 | 1.164 | 1.160 | 1.157 | 1.154 | 1.150 | 1.147 | 1.143 | 1.140 | 1.137 |
| 1.187 | 1.184 | 1.181 | 1.177 | 1.174 | 1.170 | 1.167 | 1.164 | 1.160 | 1.157 | 1.153 | 1.150 | 1.146 |
| 1.198 | 1.195 | 1.191 | 1.187 | 1.184 | 1.180 | 1.177 | 1.173 | 1.170 | 1.166 | 1.163 | 1.159 | 1.156 |
| 1.208 | 1.205 | 1.201 | 1.198 | 1.194 | 1.191 | 1.187 | 1.183 | 1.180 | 1.176 | 1.173 | 1.169 | 1.165 |
| 1.219 | 1.215 | 1.211 | 1.208 | 1.204 | 1.201 | 1.197 | 1.193 | 1.190 | 1.186 | 1.182 | 1.179 | 1.175 |
| 1.229 | 1.225 | 1.222 | 1.218 | 1.214 | 1.211 | 1.207 | 1.203 | 1.200 | 1.196 | 1.192 | 1.189 | 1.185 |
| 1.239 | 1.236 | 1.232 | 1.228 | 1.224 | 1.221 | 1.217 | 1.213 | 1.210 | 1.206 | 1.202 | 1.198 | 1.195 |
| 1.251 | 1.247 | 1.243 | 1.239 | 1.236 | 1.232 | 1.228 | 1.224 | 1.220 | 1.217 | 1.213 | 1.209 | 1.205 |
| 1.261 | 1.257 | 1.253 | 1.249 | 1.246 | 1.242 | 1.238 | 1.234 | 1.230 | 1.227 | 1.223 | 1.219 | 1.215 |
| 1.271 | 1.267 | 1.263 | 1.259 | 1.256 | 1.252 | 1.248 | 1.244 | 1.240 | 1.236 | 1.233 | 1.229 | 1.225 |
| 1.281 | 1.277 | 1.273 | 1.269 | 1.266 | 1.262 | 1.258 | 1.254 | 1.250 | 1.246 | 1.243 | 1.239 | 1.235 |
| 1.291 | 1.287 | 1.284 | 1.280 | 1.276 | 1.272 | 1.268 | 1.264 | 1.260 | 1.256 | 1.252 | 1.248 | 1.245 |
| 1.301 | 1.298 | 1.294 | 1.290 | 1.286 | 1.282 | 1.278 | 1.274 | 1.270 | 1.266 | 1.262 | 1.258 | 1.255 |
| 1.312 | 1.308 | 1.304 | 1.300 | 1.296 | 1.292 | 1.288 | 1.284 | 1.280 | 1.276 | 1.272 | 1.268 | 1.265 |
| 1.322 | 1.318 | 1.314 | 1.310 | 1.306 | 1.302 | 1.298 | 1.294 | 1.290 | 1.286 | 1.282 | 1.278 | 1.274 |
| 1.332 | 1.328 | 1.324 | 1.320 | 1.316 | 1.312 | 1.308 | 1.304 | 1.300 | 1.296 | 1.292 | 1.288 | 1.284 |
| 1.342 | 1.338 | 1.334 | 1.330 | 1.326 | 1.322 | 1.318 | 1.314 | 1.310 | 1.306 | 1.302 | 1.298 | 1.294 |
| 1.354 | 1.350 | 1.346 | 1.342 | 1.337 | 1.333 | 1.329 | 1.325 | 1.320 | 1.316 | 1.312 | 1.308 | 1.303 |

With battery fully charged and on charge at the normal rate, the cell voltage will be about as follows:

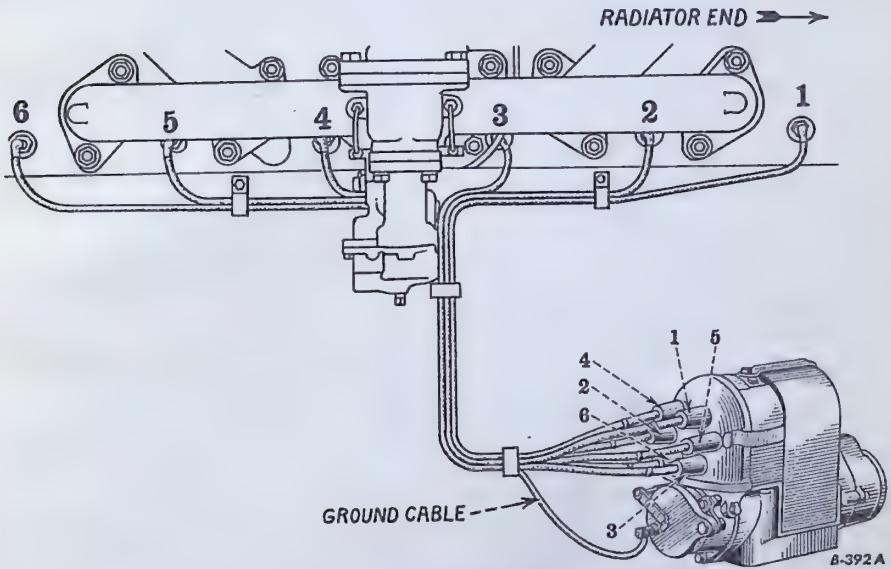
Average cell voltage at 80° usually falls between 2.5 and 2.7 volts.

Average cell voltage at 100° usually falls between 2.4 and 2.6 volts.

For accuracy always take acid temperature when reading specific gravity.

OPERATIONS SECTION

SPARK PLUGS AND CABLES



Illust. 4, Wiring plan (for F-6 Magneto).

Firing order is 1, 5, 3, 6, 2, 4, beginning at water pump end of engine.



Illust. 5

Checking the Gap between the Points.
Gap should be .035 to .040-in.

SPARK PLUGS

The spark plugs best suited for this engine are the Champion No. 44 or AC No. 18 and should be used ordinarily. Use only a complete set of either type of spark plug.

The spark plugs should be removed at the proper interval, as shown under "Periodic Inspections" page 14, Section G, or oftener if necessary for cleaning and checking gaps between electrodes. A gap of .035-inch to .040-inch should be maintained (a gage of this thickness is furnished). When making this adjustment, always bend the outer electrode, never the center

OPERATIONS SECTION

SPARK PLUGS AND CABLES - Continued

electrode as it may damage the insulator. If the gap between the electrodes is too great, due to improper setting or burning off the ends, engine will misfire and be hard to start.

CLEANING SPARK PLUGS

Sand blasting is the recommended method of cleaning spark plugs. Never scrape or clean the insulator with anything which will scratch the porcelain. Scratched porcelain allows carbon and dirt to accumulate much faster.

SPARK PLUG CABLES

If spark plug cables are removed for any reason, note the position of each cable on magneto. (*Wiring Chart - Illust. 4, shows correct wiring.*)

There should be 1/4-inch minimum clearance between the spark plug cables and the cylinder head. By maintaining this clearance, shorting-out the spark plug will be prevented and the cable will be away from the extreme heat of the cylinder head. If the cable touches the head, heat soon causes the rubber to become soft and ruins the cable.

MAGNETO

The engine is equipped with the International F-6 Magneto with Automatic Impulse Starter Coupling. Magneto used for starting only.

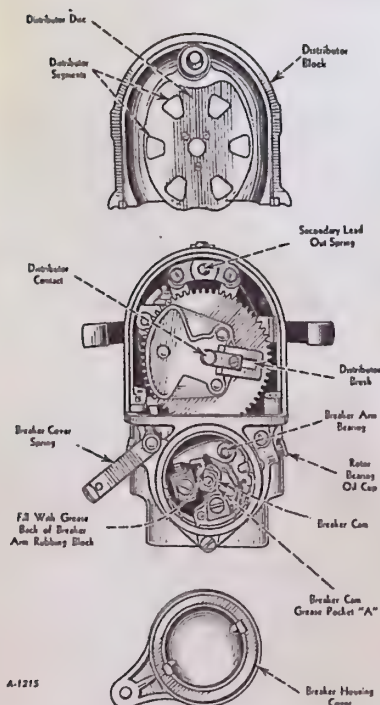
The magneto is always permanently engaged and the spark is automatically eliminated by means of the ground (cut-out) switch when operating on the Diesel cycle.

LUBRICATION (See Illusts. 6, 7 and 8.)

Every 64 hours of operation, oil the impulse coupling oil cup (5) liberally with the grade of oil specified in the "Lubrication Guide."

At the interval specified in the "Lubrication Guide" remove the distributor block (see Illust. 6) and clean the inside of distributor block and face of the distributor disc with a clean cloth moistened with Diesel fuel; solvent, dry cleaning; or kerosene; then wipe dry. Moisten a cloth with "OE" engine oil and apply a light coat on the surface of the distributor disc.

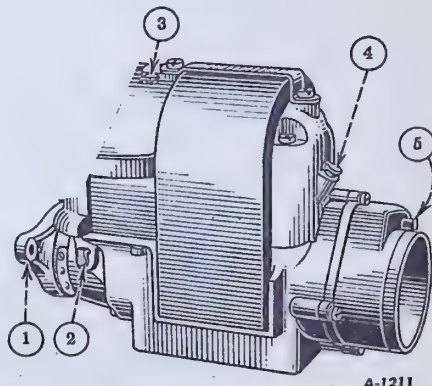
CAUTION: Be careful not to damage the carbon brush.



Illust. 6
Detail of Magneto Distributor
and Breaker Mechanism.

MAGNETO - Continued

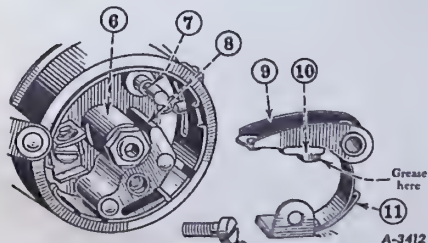
Take off the breaker housing cover (1), at the interval specified in the "Lubrication Guide", and remove the circuit breaker assembly (9). Wipe all parts clean of old grease. On the cam surface (6) apply a thin film of the grade of grease specified in the "Lubrication Guide". Pack a small quantity of the same grease on the breaker arm post (7), in pocket of breaker cam (8), and on the breaker arm rubbing block (10). Wipe the breaker arm spring (11) with a cloth dampened with "OE" engine oil to prevent rust.



Illustr. 7

Fill the distributor bearing oil cup (3) with oil and also apply a few drops of oil in the rotor bearing oil cups (2) and (4). (Follow the "Lubrication Guide" for the grade of oil to use and the interval of lubrication.)

- (1) Breaker housing cover.
- (2) Rotor bearing oil cup.
- (3) Distributor bearing oil cup.
- (4) Rotor bearing oil cup.
- (5) Impulse coupling oil cup.



Illustr. 8
 Circuit Breaker

- (6) Breaker cam.
- (7) Breaker arm post.
- (8) Breaker cam felt.
- (9) Breaker arm.
- (10) Breaker arm rubbing block.
- (11) Breaker arm spring.

OPERATIONS SECTION

MAGNETO - Continued

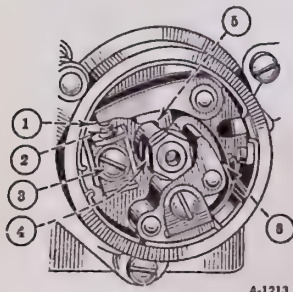
BREAKER POINTS

The breaker points should be inspected at the proper interval specified under "Periodic Inspections," page 14, Section G, for adjustment and general conditioning. The point opening should be .020-inch (when rubbing block is on high point of cam). A gage of this thickness is furnished in the tool equipment.

TO ADJUST POINTS

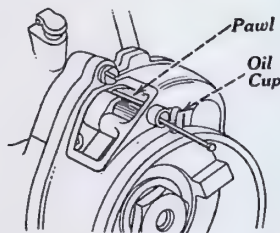
Remove the circuit breaker cover (1) see *Illusts. 6 and 7* and disengage the coupling by inserting a rod or wire into the coupling oiler, and lifting the pawl, see *Illust. 10*. Crank the engine until the rubbing block is on the high point of the cam.

Insert the gage between breaker points (1) and (2) see *Illust. 9*. If the points are too wide, or too close, loosen screw (3) slightly. Adjust so the gage will slip snugly into the opening. Tighten screw (3) and recheck the opening. Use a screwdriver as a pry to move the point support.



Illust. 9
Breaker Mechanism

- (1) Breaker arm point.
- (2) Adjustable breaker point.
- (3) Point support screw.
- (4) Cam.
- (5) Rubbing block.
- (6) Breaker arm spring.



A-1214

Illust. 10
Method of Disengaging
Impulse Coupling.

IF POINTS ARE ROUGH OR PITTED

Remove both points and dress them with a sharp fine file. If they are worn excessively replace them with new ones and adjust them as described previously.

TIMING THE MAGNETO TO THE ENGINE

If the magneto is to be removed the following instructions must be closely followed when replacing the magneto onto the engine:

ENGINE

Set the compression release lever in low-compression position for gasoline operation. Crank the engine until the No. 1 piston (the piston next to the starting crank) is on the upper dead center of the compression stroke (the compression stroke can be determined by removing the No. 1 spark plug, placing the thumb over the opening and cranking the engine until an outward pressure is felt).

Continue cranking until the D.C. 1-6 mark on the flywheel is in line with the pointer on the right side of the rear engine support (the pointer can be seen by remov-

OPERATIONS SECTION

MAGNETO - Continued

ing the plate on the right hand side of the rear engine support, above the starting motor, see *Illust. 11*).



Illust. 11
Showing the "D.C." mark
on the Flywheel.

Fully retard the spark by raising the breaker housing cover as high as it will go. To do this, remove the nut "A" and link "B", as shown in *Illust. 12*, then carefully remove the breaker housing cover so as to avoid moving the breaker cam.

MAGNETO

The impulse coupling should then be locked out of engagement by inserting a rod or wire into the oiler hole and lifting the pawl (see *Illust. 10*).

Rotate the magneto clockwise (as viewed from coupling end) until the rubbing block in breaker assembly is on the high point of the cam. Check or adjust the point opening to proper setting .020-inch.

Assemble the magneto and drive coupling parts on the engine bracket. Insert the magneto base screws loosely into the magneto.

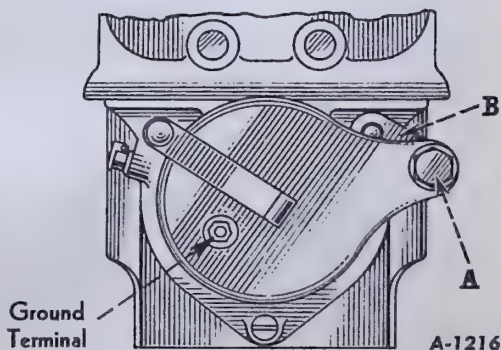
NOTE: Do not use screws which are longer than the originals as they will damage the magneto.

Remove the distributor block (see *Illust. 6*). Grasp the magneto half of the adjustment block (see *Ref. No. 4, page 25, Section 3 of the Repair Section*). Rotate it clockwise (as viewed from the coupling end) until the brush in the distributor disc is under the distributor block terminal marked "No. 1," and the breaker points are just beginning to open.

With the magneto in this position, locate the two holes in adjustment coupling that align. Insert shims between the two halves of the coupling so the cap screws will pass through the holes in the shims and enter the holes in the tapped half of the adjustment coupling.

NOTE: The holes in the adjustment coupling are so spaced that only two pairs of holes will line up exactly. Do not force the cap screws as the setting will be incorrect.

Tighten the magneto base cap screws and replace the circuit breaker cover and distributor block. Be careful to not damage the brush or contact spring.



Illust. 12
Breaker housing cover
with timing link and
ground terminal.

OPERATIONS SECTION

MAGNETO - Continued

TO CHECK THE TIMING

- (1) Fully retard the spark.
- (2) Remove the circuit breaker cover (see *Illust. 12*).
- (3) Crank the engine until the breaker points are just beginning to open. If the timing is correct, the D.C. mark on the flywheel will align with the timing pointer on the left side of the rear engine support. (See *Illust. 11*).

TO CHECK TIMING WITH IMPULSE ENGAGED

- (1) The impulse coupling should be engaged manually by inserting a small rod or wire into the oiler hole (see *Illust. 13*) and lifting up on the latch.
- (2) Crank the engine slowly until the impulse trips.
- (3) The D.C. mark on the flywheel should be in line, or not more than 8° below (1-inch on flywheel rim) and never above the timing pointer on the rear engine support. (See *Illust. 11*.)
- (4) The engine firing order is 1, 5, 3, 6, 2, 4 beginning at the radiator end of the engine.
- (5) Attach the spark plug cables to the engine and magneto. Start

by connecting the No. 1 cylinder spark plug to socket marked "1" on the distributor block. Advancing clockwise on distributor block, connect the next socket with No. 5 cylinder; next with No. 3 cylinder; next with No. 6 cylinder; next with No. 2 cylinder, and the last with No. 4 cylinder. (See "Magneto Wiring Diagram," *Illust. 4*).

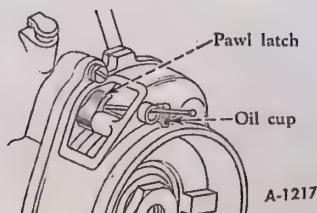
- (6) Be sure the cable terminals are pushed all the way into the distributor block sockets, and that they make good contact, otherwise a green coating will form in the hole.

- (7) The magneto is now correctly wired and timed.

- (8) When replacing the sheet metal impulse cover, be sure that the joint is lapped.

- (9) The magneto impulse cover should always be assembled with the hole on the bottom to facilitate drainage in damp or rainy weather.

- (10) When operating under extremely dusty conditions, the flap over the hole should be partially closed to prevent the entrance of excessive dust.



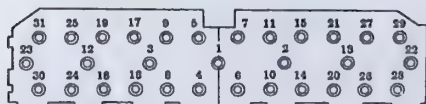
Illust. 13
Method of Engaging
Impulse Coupling

OPERATIONS SECTION

ENGINE SERVICE OPERATIONS (MINOR)

CYLINDER HEAD GASKET

For the most satisfactory results in tightening the cylinder head after installing the cylinder head gasket, tighten all nuts fairly snug, starting with the row on the center line then going to the others. Retighten in the same order, giving each nut a small part of a turn at a time. Continue this until all the nuts are tight. Do not screw one nut down perfectly tight and then go to the next as you will not secure an even pressure on the gasket in this manner.



A-1218

Illustr. 1

Showing the proper Sequence for tightening the Cylinder Head Nuts.

After replacing the cylinder head, it is necessary to assure against leaks by retightening the stud nuts after the engine has been run and the water jacket becomes thoroughly heated. To tighten the nuts properly, the valve rocker shaft assembly must be raised.

Be sure to adjust the valve tappet clearance after the last tightening of the cylinder head stud nuts (see "Valve Adjustment" on page 4).

REMOVING CYLINDER HEAD OR VALVES

Whenever the cylinder head or the valve mechanism has been removed, care must be taken when they are replaced that valves are not damaged by coming into contact with the top of the piston, or through improper adjustment of the valve

lever screw by being pushed down too far into the cylinder sleeve. To prevent this, always loosen the valve lever screw clear up and bring the piston to the top center of the compression stroke. Then screw down on the adjustment screw until the proper clearance is obtained.

After replacing the cylinder head, check to see that there is a clearance of not less than .185-inch, or more than .205-inch, between all six starting valve covers and starting valve shaft cam rollers, in Diesel position. If the clearance is incorrect, readjust.

REMOVAL OF PISTONS

If the pistons are to be removed from the crankcase, care must be taken to see that each part is reassembled in its original place and position. To assist in this operation, pistons, connecting rods and connecting rod caps are marked with the corresponding cylinder number 1, 2, 3, 4, 5, and 6, and the cylinder numbers are also marked on the bottom flange of the crankcase.

Each piece should be reassembled so that the numbers correspond. Also, all the numbers should be on the same side of the assembly as the number on the crankcase flange indicates.

IRREGULAR FIRING OF ENGINE

The bleeder valves at the top of the injection nozzles at the cylinder head should be opened only in case of irregular firing caused by entrapped air in the injection lines, or if the engine is continuously noisy in one cylinder. Opening the bleeder valve will locate the noisy cylinder and usually indicate a faulty injector.

(See Instructions on page 4, Section 7, for venting fuel system).

OPERATIONS SECTION

AIR CLEANING SYSTEM

It is very essential that the oil cup be cleaned and filled regularly with new oil.

OIL CUP

Clean and refill the oil cup every day or after every 8 hours of operation (more frequently under severe dust conditions). Refill the oil cup to the oil level bead with same grade oil as used in the engine crankcase. The capacity of the oil cup is 6-3/4 pints (U.S.).

Before removing the oil cup, clean or wipe the oil or grit from the top bead of the oil cup, oil cup retaining clamp and the surface under the clamp.

AIR INTAKE CAP AND TOP CASTING

The air intake cap is provided with an inlet screen which prevents large particles, such as chaff, leaves, etc., from entering the air cleaner.

Keep this inlet screen clean. The holes must be free from paint and must be kept open at all times. Dust, oil or water may collect on the screen and clog up the holes enough to restrict the flow of air to the engine. Restricted air flow will reduce the horse-power delivered by the engine.

The air intake pipe, from the intake cap to the air cleaner, should not be allowed to collect dirt on the inside. Clean this pipe when the air cleaner is removed, and at the same time, clean the inlet tube through the air cleaner.

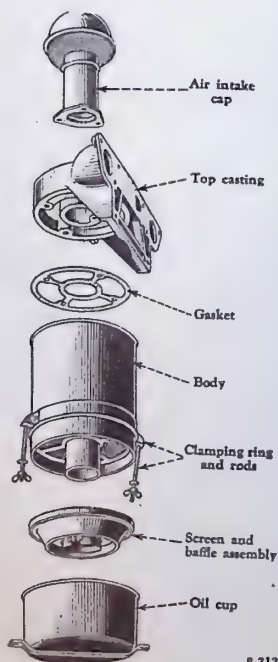
Also, thoroughly clean out inside of the top casting.

WASHING THE CLEANER

After every 64 hours of operation, particularly if operating the tractor in an atmosphere heavily laden with dust, chaff or lint, re-

move the entire air cleaner from the tractor and completely disassemble it. Wash the parts thoroughly in Diesel fuel; solvent, dry cleaning; or kerosene. Be sure to clean out the air intake pipe, also thoroughly clean out the inside of the top casting.

After all the parts have been thoroughly cleaned, replace the air cleaner body on the tractor. Make sure all the joints are airtight, then replace the air intake cap. Fill the oil cup to the proper level with the specified grade of oil and replace it on the air cleaner. Be sure it is held securely in place by the cup clamps.



B-313

Illustr. 2
"Exploded" View of the Air Cleaner
Removed from the Tractor.

OPERATIONS SECTION

AIR CLEANING SYSTEM - Continued

Replace the air cleaner. Make sure all the joints are air tight and be sure the screens are held firmly in place. Replace the air intake cap and replace the oil cup after it is properly filled with oil. Make sure the oil cup is held securely in place by the cup clamp.

GENERAL PRECAUTIONS

To prevent the entrance of dirt into the engine, it is absolutely essential that frequent inspections be made of the flexible

rubber connections to the carburetor and air cleaner. The flexible connections should be replaced before they deteriorate. To eliminate any undue strain on the connections, make sure the pipes line up. See that all the joints between the air cleaner and the cylinders of the engine are tight, this includes the flexible connections, carburetor and manifold joints, and gaskets. All the gaskets must be in good condition and the bolts should be drawn up tight.

LUBRICATING OIL FILTERS (Two) (Absorption Type)

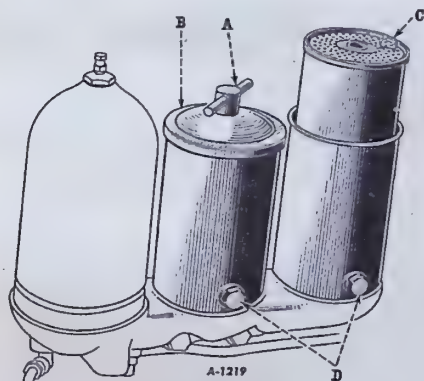
The life of your engine depends upon clean oil being circulated to all bearings. Every good operator knows that minute particles of abrasive matter eventually accumulate in the crankcase of the engine, and that in the normal course of engine operation, the lubricating oil undergoes changes which produce sludge, acids, gums, varnish, and other harmful by-products.

The purpose of the oil filter is to separate and remove the dirt and other foreign substances from the oil to prevent these injurious materials from being circulated to the engine. The oil filter elements should be replaced at the time engine oil is changed as specified in the "Lubrication Guide."

Close adherence to the simple, common-sense procedure for keeping dirt and oil impurities away from precision-made engine parts will safeguard your engine against undue wear and the operating troubles and upkeep expense which are a natural result of that condition.

The oil filter elements are housed in the rear two shells of the group of three on the left side of the engine.

To replace elements, loosen the bar nuts "A" on top of the two shells and remove the caps "B" over the shells. Remove old elements "C". Remove drain plugs "D" to allow oil to drain out. Replace with new elements; then replace the caps, tightening the bar nuts by hand only.

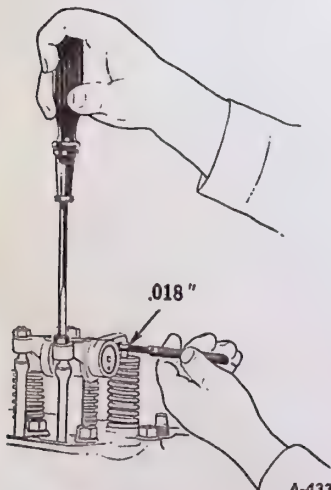


Illustr. 3

OPERATIONS SECTION

VALVE CLEARANCE ADJUSTMENT

Check the valves for clearance every 500 to 512 hours and adjust the clearance if necessary. A clearance of .018-inch is necessary between end of valve levers and valve stems when valves are closed and when engine is hot.



Illust. 4
Gaging Valve Levers
with a Feeler Gage.

(1) Before checking valve clearance, ground the magneto by fastening a wire to the ground terminal (see Illust. 12, Section 5) and to a bolt on the crankcase. This will eliminate any danger of accidentally starting the engine.

(2) Set the compression release lever in low compression position (gasoline operation).

(3) Remove valve housing.

(4) Remove spark plug from the No. 1 cylinder (the cylinder next to the water pump).

(5) Place thumb over the spark plug opening and slowly crank the engine until an outward pressure can be felt. Pressure indicates No. 1 piston is moving toward upper dead center of the compression stroke.

(6) Continue cranking slowly until D.C. 1-6 mark on flywheel is in line with pointer on injection pump side of flywheel housing. Both valves are now closed on compression stroke of No. 1 cylinder. (See Illust. 11, Section 5).

(7) Check clearance of No. 1 valves and adjust, if necessary, by following outline below.

(8) Loosen the lock nut and adjust screw in valve lever so that gage slips snugly between end of valve lever and valve stem (see Illust. 4).

(9) Tighten lock nut and recheck clearance with gage.

(10) Crank engine 1/3 of complete turn of crankshaft until D.C. 2-5 mark on flywheel is in line with pointer.

(11) Check No. 5 valves and adjust if necessary.

(12) Continue this procedure turning engine 1/3 revolutions at a time and measuring and adjusting clearances of each cylinder's valves in succession according to firing order of engine, which is 1-5-3-6-2-4.

(13) After all valve levers have been adjusted, remove the wire grounding the magneto.

Important: Be accurate -- use a feeler gage for checking the valve clearance.

OPERATIONS SECTION

SUGGESTIONS FOR CHECKING TROUBLE

Study the problem before making any changes.

If any adjustments are to be disturbed, the original setting should be noted, so this same setting may be restored in case the part changed does not remedy the trouble.

FAILURE TO START ON GASOLINE:

No gasoline in carburetor.
Gasoline supply cock closed.
Carburetor choked too much.
No spark from magneto.
Gears engaged (transmission).
Gasoline starting device not set.
Condensation on spark plugs.

MISSING AND BACKFIRING:

Water in gasoline.
Air leaks around intake manifold.
Starting valves not properly seated.

FAILURE TO CHANGE OVER TO HIGH COMPRESSION OPERATION:

Starting valve mechanism sticks.
Injection pump not primed (vent air).
Fuel supply cock closed at tank.
Speed control hand lever not set in proper position.
Fuel supply pump not developing fuel pressure.

LACK OF LUBRICATING OIL PRESSURE:

Insufficient amount of oil.
Dirt under pressure regulating valve.
Oil pump strainer clogged or pump not working.
Defective oil pressure indicator or pipe lines.

LACK OF POWER

Injection pump air bound (vent air from fuel system).
Insufficient fuel, filter clogged, supply pump not working properly.
Clutch slipping, exhaust pipe or air cleaner clogged or restricted.

(Also see "Lack of Compression and "Overheating").

KNOCKING:

Loose piston pin, connecting rod, camshaft or crankshaft bearing.
Broken piston rings or loose pistons.
Combustion knock in one or two cylinders generally indicates leaky injection nozzle valve.
General rough running usually due to improper timing of injection.
Poor grade of fuel, or water in fuel.
Excessive carbon in cylinder.

LACK OF COMPRESSION:

Sticky, dirty, pitted or improperly adjusted valves.
Stuck, worn or broken piston rings.
Worn pistons or cylinder sleeves.
Leaky cylinder head gasket.
Leaky gasoline starting valve.

(Also see "Lack of Oil Pressure").

OVERHEATING:

Insufficient amount of water, fan belt slipping, excess load on engine.
Inside of radiator and cylinder block limed up or clogged with dirt.
Outside of radiator or radiator screen covered with dirt or chaff.
Lack of oil pressure, or water pump not working properly.
Water pump air bound.

ENGINE SMOKES:

Overloaded, injection of fuel too early, lack of compression, poor grade of fuel, piston pumping lubricating oil.

EXCESSIVE LUBRICATING OIL CONSUMPTION:

Oil leaks, pistons pump oil, poor grade of lubricating oil being used, piston rings stuck in grooves.

NOTE: If the injection pump does not perform properly, notify proper maintenance personnel at once.

OPERATIONS SECTION

MEMORANDA

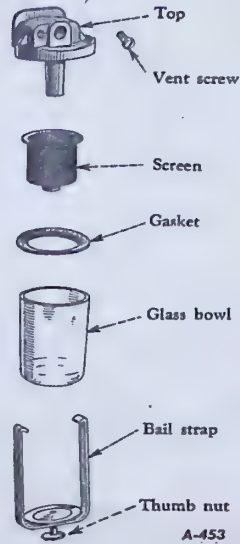
OPERATIONS SECTION

DIESEL FUEL WATER TRAP

Clean fuel is important to successful Diesel engine operation. The fuel is strained and filtered between the tank and injection pump by the fuel water trap and filters.

To clean water trap, close the fuel tank shut-off valve. Clean entire water trap thoroughly on outside to prevent dirt from getting into fuel passages. Remove bolt from water trap top and remove entire water trap from the engine. Loosen thumb nut under water bowl and remove bail strap. Then remove the glass bowl. *(It is preferable, if you have sufficient clearance, to remove only the glass bowl for cleaning instead of the entire assembly which would break the seat between the bracket and the trap.)* Loosen gasket and pull screen off tube. If screen is dirty, wash screen and glass bowl in Diesel fuel; solvent, dry-cleaning; or kerosene, to remove all dirt and sediment. Reassemble screen and gasket. Gasket must be in its proper place and in good condition. Then reassemble glass bowl and strap and tighten thumb nut by hand. Then assemble entire water trap to bracket by tightening bolt.

After reassembling, open fuel tank shut-off valve and vent the air by opening the vent screw. See other INSTRUCTIONS FOR VENTING AIR on page 4.



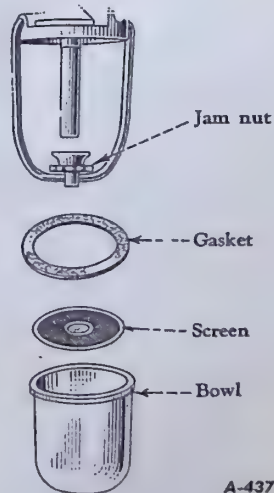
Illustr. 1
Fuel Strainer and Water Trap.

GASOLINE STRAINER

CLEANING THE GASOLINE STRAINER AND SEDIMENT BOWL

The gasoline strainer should be cleaned at the interval specified under "Periodic Inspections;" page 14, Section G; to do this, proceed as follows:

- (1) Close the shut-off valve.
- (2) Take the strainer apart by loosening the lower jam nut.
- (3) Clean out the sediment bowl and clean the screen if necessary.
- (4) When reassembling the strainer, be sure the cork gasket between the bowl and the main body is in good condition and does not leak.



Illustr. 2
Showing the Gasoline Strainer with Glass Bowl Removed for Cleaning.

OPERATIONS SECTION

DIESEL FUEL FILTER

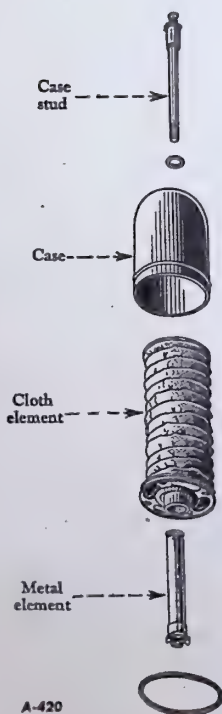
(Combination Cloth and Metal Elements)

The Diesel fuel filter (on the left side of the engine) should be cleaned regularly at the interval specified in the "Lubrication Guide."

CLEANING THE DIESEL FUEL FILTER

Remove the case studs and the case. Remove the elements and wash both the metal and cloth elements in Diesel fuel; solvent, dry cleaning; or kerosene.

After cleaning the elements, vent the air from the injection system before operating on the Diesel cycle. This can be done as described on page 4.

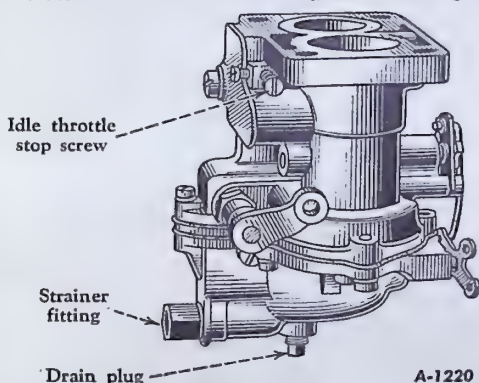


Illustr. 3
Showing the Diesel Fuel Filter
Taken Apart for Cleaning.

OPERATIONS SECTION

DIESEL STARTING CARBURETOR

The model C-12 Carburetor is used only when starting the engine. The gasoline level is controlled by a conventional float and float valve mechanism when starting and running



Illustr. 4

The throttle shaft is so located that when the air passing through the carburetor reaches a certain speed, the air pressure against the throttle butterfly overcomes the tension of the throttle spring and closes the throttle.

The throttle lever comes in contact with the idle throttle stop screw after throttle closes; the position of this stop screw then controls the engine speed.

The starting choke regulates the air for starting.

ADJUSTMENT - (In case Carburetor has been disturbed)

on gasoline. The float valve is locked into its seat, shutting off gasoline to fuel bowl when engine changes over to operate on Diesel.

The float valve is protected against dirt and foreign material by a strainer. This strainer should be removed occasionally and cleaned.

NOTE: Periodically, check the screws fastening the fuel bowl to fuel bowl cover and see that cover screws are kept tight to prevent any leakage of air past the fuel bowl cover gasket.

TO CLEAN STRAINER

- (1) Close gasoline shut-off valve at gasoline tank.
- (2) Disconnect gasoline pipe at carburetor.
- (3) Unscrew strainer fitting from carburetor, wash off in Diesel fuel; solvent; dry cleaning; or kerosene, and reassemble.
- (4) Open gasoline shut-off valve.

To Adjust Idle Speed

Loosening idle throttle lock screw and turning out idle throttle stop screw reduces speed of engine.

NOTE: In cold weather the idle throttle screw should be readjusted to get correct idling speed.

Engine speed, when operating on gasoline, should not exceed 800 RPM.

Present day grade of gasoline has a tendency to form gum; therefore, it is necessary that gasoline tank and fuel bowl be completely drained of fuel when engine is to be out of service for more than two weeks. These gum deposits can be completely dissolved with a mixture of one part alcohol and one part benzol, or with acetone.

OPERATIONS SECTION

VENTING AIR FROM INJECTION NOZZLES, FUEL FILTER AND WATER TRAP

(See Illust. 5)

NOTE: The engine will fail to run on the Diesel cycle if there is any air in the fuel injection system.

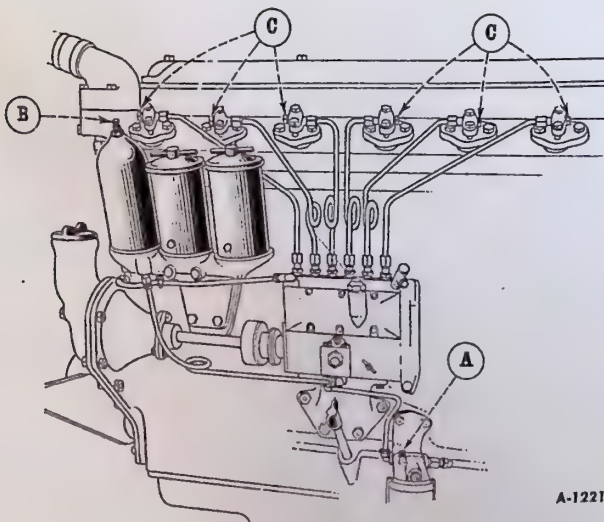
To remove the air, it is necessary to bleed the system by opening the vent cocks successively on the water trap, fuel filter and injection nozzles.

(1) With the fuel tank shut-off valve open, open the vent cock "A" on the water trap (with engine stopped).

(2) Close the vent cock when the fuel starts to flow.

(3) Open the fuel filter vent cock "B"; then start the engine. With the engine operating on the gasoline cycle, close the vent cock when the fuel starts to flow. Then, advance the engine speed control lever slightly while venting the fuel and injection line.

(4) Open each nozzle vent "C" individually. Close each cock when the fuel starts to flow.



A-1221

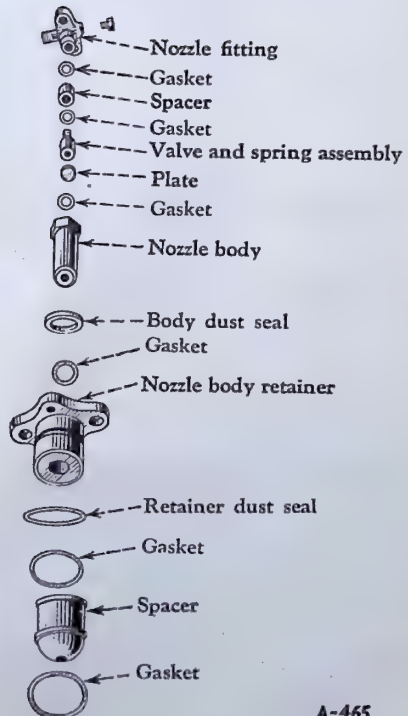
Illust. 5

OPERATIONS SECTION

INJECTION NOZZLE

If any cylinder seems to fire too noisily, it usually is an indication that the injection nozzle valve is leaking badly. Clean nozzle and fitting thoroughly with Diesel fuel; solvent, dry cleaning; or kerosene. Remove nozzle and disassemble. A leaky valve will generally appear black. Clean the valve and seat, and wash in Diesel fuel; solvent, dry cleaning; or kerosene.

The nozzle plate should be free of carbon. There should be no carbon in nozzle body spacer.



A-465

Illust. 6
Injection Nozzle

OPERATIONS SECTION

GOVERNOR

The governor of this engine is an integral part of the fuel injection pump and is fully enclosed and sealed at the factory. It operates in a bath of oil and its function is to maintain the engine speed selected by the operator, and to automatically proportion the fuel to the load.

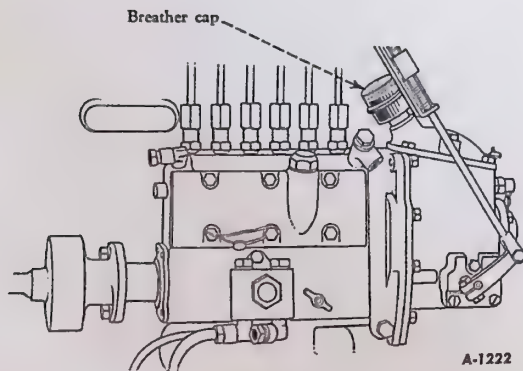
ENGINE SPEED

Never operate the engine at more than the regular governed speed. Excessive speeds are harmful.

The rated or maximum full load governed speed is 1200 RPM; maximum idle speed is 1305 to 1355 RPM; minimum speed (hand throttle) is 425 RPM.

CLEANING GOVERNOR BREATHER CAP

The breather (See *Illust. 7*) should be removed and cleaned once a month, or more often if dusty conditions require it. To clean the breather, wash it in Diesel fuel; solvent, dry-cleaning; or kerosene, dip it in engine lubricating oil and replace it after the excess oil has been wiped off.



Illust. 7

OPERATIONS SECTION

FUEL INJECTION PUMP AND GOVERNOR

DO NOT ATTEMPT TO ADJUST PUMP OR GOVERNOR

In case of serious trouble, sufficient to cause failure of the pump to operate satisfactorily, check over instructions regarding cleaning and oiling operations.

Use clean Diesel fuel for good and continuous operation of the Injection Pump.

We recommend, in case of trouble, to replace the entire unit. This should be done by the proper maintenance personnel.

REMOVING AND REPLACING BOSCH FUEL INJECTION PUMP

TO REMOVE INJECTION PUMP

Whenever it becomes necessary to remove the complete fuel injection pump from the engine the following instructions apply:-

KEEP ALL PARTS CLEAN

Before removing any fuel lines from the pump, first thoroughly clean the pump and all connections with Diesel fuel; solvent, dry-cleaning; or kerosene. When the lines are removed the connections on the engine must be covered to prevent dirt from entering the system.

Close the fuel shut-off valve at the main tank. Disconnect all fuel lines leading to the injection pump.

Remove the six injection pump base screws and disconnect the injection pump control rod. Slip the

drive coupling boot over coupling (with use of screw driver), then lift injection pump up from its base.

TO REPLACE INJECTION PUMP

Slip the coupling boot over the drive shaft before replacing pump. Assemble pump on its base.

Replace base cap screws; reconnect the injection pump control rod, fuel lines, overflow tube and injection lines. Open the fuel shut-off valve.

Injection pump timing couplings are so made that they can be assembled one way only to give the correct timing of pump with relation to crankshaft.

Start the engine and bleed the fuel system (see page 4).

Reset the injection timing as required (see page 8).

OPERATIONS SECTION

INJECTION PUMP TIMING

The injection pump drive has a timing adjustment between drive flange and timing coupling adjuster. The adjustment is normally set with cap screw "A" at center of slot "B" and mark on drive flange "D" at center mark of graduations on timing coupling adjuster "C".

In order to be sure of the best operating condition, which may vary on account of local conditions, the adjustment indicator can be tried on either side of center mark "C" and set at the best operating position.

The best location is where engine speed is maximum for a fixed load and engine operation smooth with cleanest exhaust.

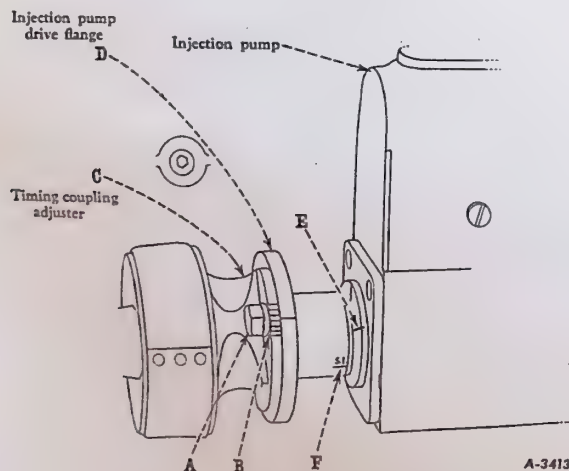
To change location of indicator, loosen cap screws "A" on indicator and turn injection pump to desired position, then tighten cap screws "A".

For advanced position, turn pump flange "D" clockwise. For retarded position, turn counterclockwise.

Timing couplings are so made that they can be assembled only one way for correct timing of pump with relation to crankshaft.

The injection pump is timed for port closing of No. 1 unit. With engine turned over so that No. 1 piston is on the compression stroke, and just before upper dead center, "S.I." mark on flywheel will register with timing indicator on the right side of the rear engine support. In this position the "S.I." mark "F" on injection pump drive flange "D" (at front end of pump) will register with "S.I." mark "E" on front end of pump housing with adjustments in normal position.

NOTE: If front gear cover is off, the letters on gear faces will not register in the above position.



Illustr. 8
Injection Pump Coupling Showing Timing

OPERATIONS SECTION

GENERAL ENGINE LUBRICATION

The life of any engine depends on the care it is given. Proper lubrication is very important.

This engine has a pressure feed lubrication system.

The engine is equipped with two oil filters which clean the oil continuously while the engine is running. To obtain the full benefit from the filters, the elements should be replaced with new ones every time the oil in the crankcase is changed. (See "Lubrication Guide" for the proper oil change interval.) (Cleaning the old elements is not satisfactory.)

OIL LEVEL GAGE

Do not run the engine for any length of time when the level of the oil is below the low mark on the gage.

To test the oil level with the bayonet gage, unscrew the wing nut, remove the gage, wipe it clean and insert it in crankcase until wing nut rests on top of the gage sleeve threads. Do not screw nut onto the sleeve. Remove gage and read oil level. Never check the oil level while engine is running.

OIL PRESSURE INDICATOR

An oil pressure indicator indicates the pounds of pressure of the oil circulating through the engine. Under all operating conditions, the pressure of the oil in the engine should hold the indicator in the white section of the gage. Should the indicator not register, stop the engine at once and inspect oil system to find the cause of failure. If unable to find the cause, notify proper maintenance personnel.

Always look at the oil pressure indicator immediately after starting engine.

OIL PUMP

The gear type oil pump in the crankcase has a screen attached to the oil intake which stops the

large dirt particles from entering the oiling system. This screen should be cleaned whenever the oil pan is removed. The oil intake floats on top of the oil in the crankcase and draws the oil from the surface, thus eliminating the possibility of mixing water or sediment with the oil.

IMPORTANT.

Engines shipped to desitnations in the United States of America, Canada and Mexico are filled with thinned SAE-10 oil before leaving the factory. This oil, as shipped from the factory, may be used when operating in air temperatures below zero F. (until the next regular oil change). For temperatures above 0° F., use engine oil as specified under the proper temperature range, in the "Lubrication Guide".

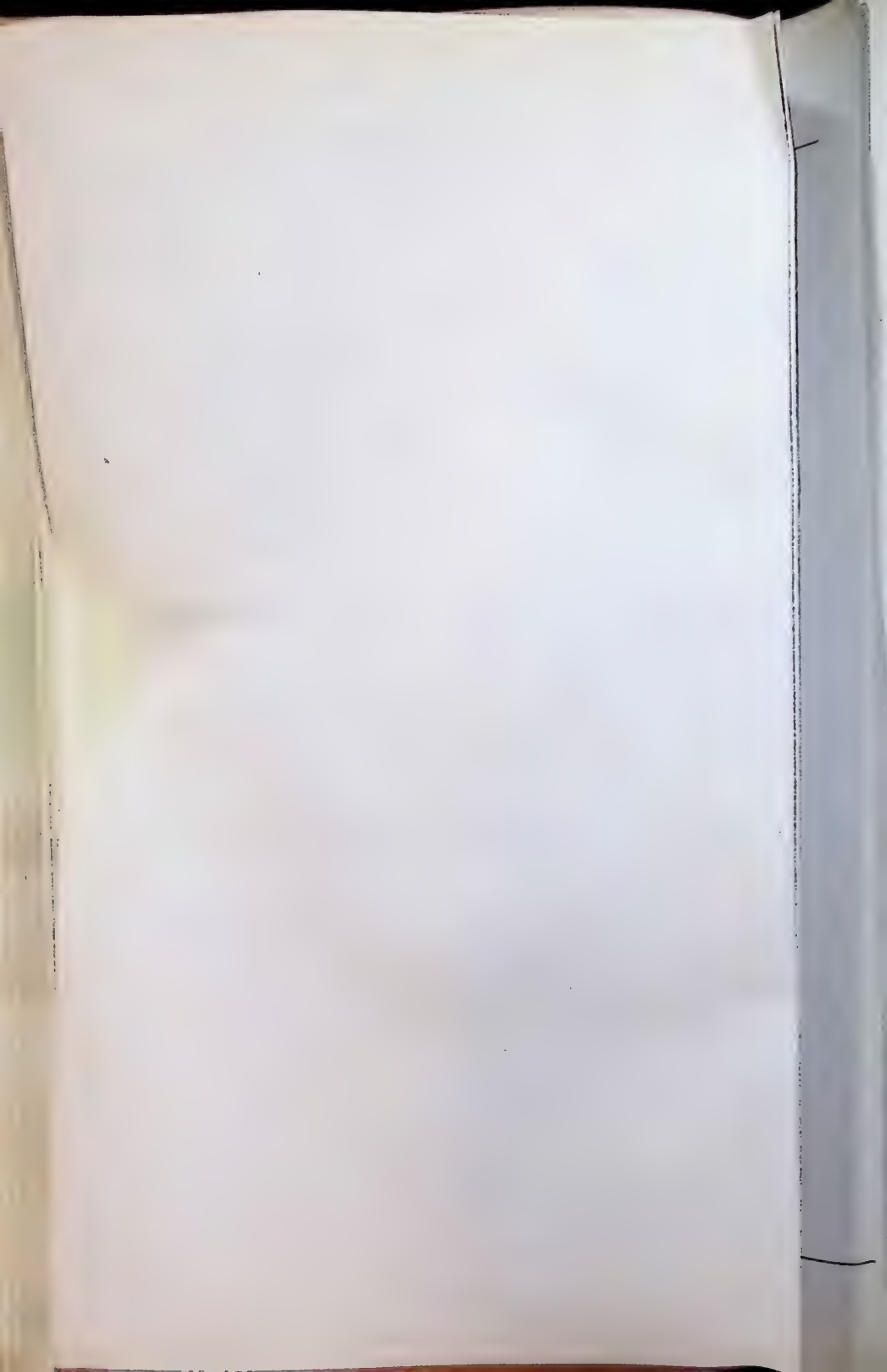
After changing to a lighter grade of oil, the engine should be started and run at least 5 to 10 minutes, so that the lighter oil is worked into the bearings and on cylinder walls.

Change oil at the proper interval, as indicated in the "Lubrication Guide". Drain crankcase lubricant while the oil is warm so it will drain freely. (All lubricating oil is drained from the crankcase of engines for export. (See "Lubrication Guide" for oil to use.)

ENGINE LUBRICATING OIL

Engine lubricating oil shall be of well-refined petroleum oils, free from water, sediment, and without admixtures of fatty oils, acids, soaps, resins or any other substance not derived from petroleum. Oil shall not corrode any metal used in engine construction. Also engine lubricating oil containing additive products not necessarily derived from petroleum, but being of noncorrosive type, is satisfactory for use in our engines.

See special instructions for "COLD WEATHER OPERATION" on pages 11 and 12 of Section G.



OPERATIONS SECTION

TRACK ASSEMBLIES

If the track chain is too loose it may have a tendency to climb the sprocket when backing the tractor.

When the track adjustment is either too tight or too loose, it causes undue wear on the track links, pins, bushings and bearings, and also on the front idler bearings.

The two heavy coil springs in each track frame are properly set at the factory and require no adjustment. Their purpose is to allow the front idler to recoil under shock but exert no tension on the track when in normal operating position.

On a new unit check the track shoe bolts every 8 hours of operation until it becomes evident that set has taken place. The evidence of set having taken place can be determined when the bolts retain a tightness of 240 to 250 ft. - lbs. The bolts used for attaching the track shoes to the tracks are heat-treated alloy bolts and they will stand considerable tightening strain (common bolts should not be used.)

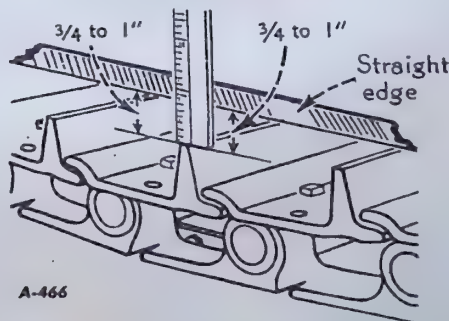
While tightening the bolts it is well to strike the head of the bolt several sharp hammer blows and retighten. As a safety measure

we recommend you use goggles to protect your eyes while striking the bolts.

METHOD OF CHECKING SLACK IN TRACK CHAIN

To check the slack in the track chain, the chain must be tight everywhere except on the top, between the front idler and the sprocket. This can be accomplished by placing a wooden block, approximately one foot in height, under the foremost track shoe lug; then, with the engine running, put the tractor in low gear and engage the clutch just enough so the sprocket drive tightens the chain along the ground and around the sprocket. After locking the brake and stopping the engine, stand on top of the track chain. Your weight will pull the chain tight around the front idler. All the slack should now be in the top part of the track chain.

Using a string or a straight edge align the tips of the track shoe cleats across each of the three spans between the top idlers and sprocket and front idler. The sag of the chain under the straight edge of each span should be approximately $\frac{3}{4}$ to 1-inch. (See Illustr. 1).



A-466

Illustr. 1
Method of Checking Slack in Track Chain.

Manufacturer's Serial Number located on plate on upper left-hand corner of dash.

LUBRICATION GUIDE FOR TD-18 TRACTOR

CAUTION! All points indicated by short-shaft, dotted arrows are points that are on both sides of vehicle and must be serviced in accordance with instructions for similar point on opposite side.

INTERVALS

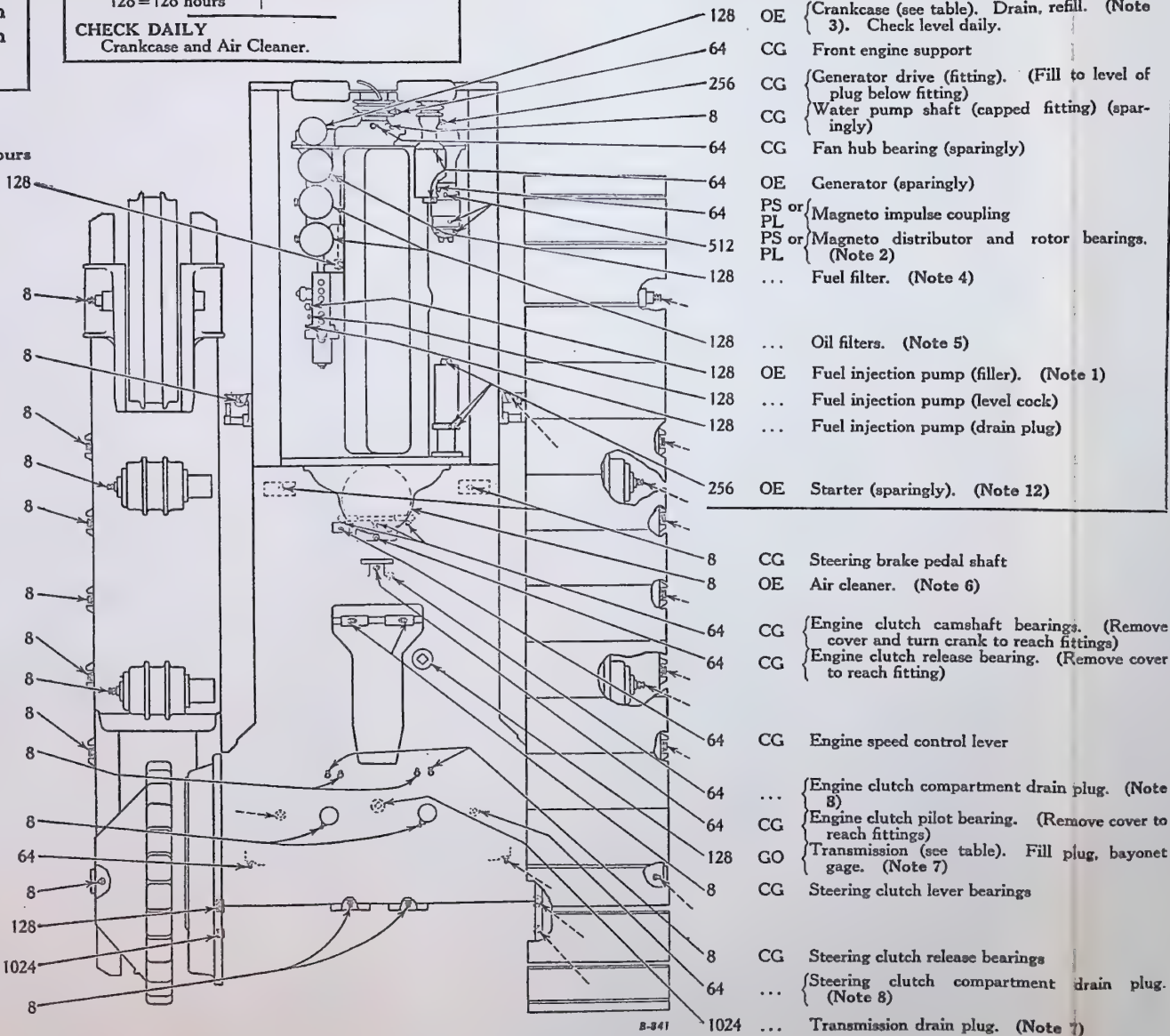
| | |
|-----------------|-------------------|
| 8 = 8 hours | 256 = 256 hours |
| 64 = 64 hours | 512 = 512 hours |
| 96 = 96 hours | 1024 = 1024 hours |
| 128 = 128 hours | |

CHECK DAILY
Crankcase and Air Cleaner.

SERVICED FROM UNDER HOOD

Lubri-
Hours cant

| | |
|---|------|
| Crankcase drain plug. (Note 3)..... | 128 |
| Front idler (see table). (Note 13)..... | GO |
| Track frame guide roller..... | CG |
| Track roller (see table). (Notes 8 and 13) | GO |
| Track idler (see table). (Note 13)..... | GO |
| Track roller (see table). (Notes 8 and 13) | GO |
| Track roller (see table). (Notes 8 and 13) | GO |
| Track idler (see table). (Note 13)..... | GO |
| Track roller (see table). (Notes 8 and 13) | GO |
| Steering clutch release fork lower bearings | CG |
| Steering clutch release fork upper bearings | CG |
| Steering clutch pilot bearing. (Note 9)... | CG |
| Track frame pivot..... | CG |
| Final drive (see table) (fill and level plug). (Note 7) | GO |
| Final drive drain plug..... | 1024 |
| Track frame diagonal braces..... | CG |



| | | |
|------|----------|---|
| 128 | OE | {Crankcase (see table). Drain, refill. (Note 3). Check level daily. |
| 64 | CG | Front engine support |
| 256 | CG | {Generator drive (fitting). (Fill to level of plug below fitting) |
| 8 | CG | {Water pump shaft (capped fitting) (sparingly) |
| 64 | CG | Fan hub bearing (sparingly) |
| 64 | OE | Generator (sparingly) |
| 64 | PS or PL | {Magneto impulse coupling |
| 512 | PS or PL | {Magneto distributor and rotor bearings. (Note 2) |
| 128 | ... | Fuel filter. (Note 4) |
| 128 | ... | Oil filters. (Note 5) |
| 128 | OE | Fuel injection pump (filler). (Note 1) |
| 128 | ... | Fuel injection pump (level cock) |
| 128 | ... | Fuel injection pump (drain plug) |
| 256 | OE | Starter (sparingly). (Note 12) |
| 8 | CG | Steering brake pedal shaft |
| 8 | OE | Air cleaner. (Note 6) |
| 64 | CG | {Engine clutch camshaft bearings. (Remove cover and turn crank to reach fittings) |
| 64 | CG | {Engine clutch release bearing. (Remove cover to reach fitting) |
| 64 | CG | Engine speed control lever |
| 64 | ... | {Engine clutch compartment drain plug. (Note 8) |
| 64 | CG | {Engine clutch pilot bearing. (Remove cover to reach fittings) |
| 128 | GO | {Transmission (see table). Fill plug, bayonet gage. (Note 7) |
| 8 | CG | Steering clutch lever bearings |
| 8 | CG | Steering clutch release bearings |
| 64 | ... | {Steering clutch compartment drain plug. (Note 8) |
| 1024 | ... | Transmission drain plug. (Note 7) |

TD-18 TRACTOR (For Corps of Engineers)

OM UNDER HOOD

see table). Drain, refill. (Note 1)
 k level daily.
 e support
 rive (fitting). (Fill to level of
 y fitting)
 p shaft (capped fitting) (spar-
 aring (sparingly)
 paringly)
 pulse coupling
 distributor and rotor bearings.
 (Note 4)

(Note 5)
 on pump (filler). (Note 1)
 on pump (level cock)
 on pump (drain plug)
 rly). (Note 12)

ake pedal shaft
 (Note 6)

atch camshaft bearings. (Remove
 turn crank to reach fittings)
 ch release bearing. (Remove cover
 fitting)

nd control lever

ch compartment drain plug. (Note
 ch pilot bearing. (Remove cover to
 ings)
 on (see table). Fill plug, bayonet
 Note 7)

atch lever bearings

atch release bearings

clutch compartment drain plug.

on drain plug. (Note 7)

KEY TO LUBRICANTS

OE = OIL, engine—crankcase grade
 GO = LUBRICANT, gear—universal
 CG = GREASE, general purpose
 No. 1 (Above +32° F.)
 No. 0 (+32° F. to 0° F.)
 Refer to EFSB-L-1000D
 (Below 0° F.)
 Refer to EFSB-L-1000E
 (Above +90° F.)
 WB2 = GREASE, general purpose No. 2
 PL = OIL, Lubricating, Preservative,
 Light
 or
 PS = OIL, Lubricating, Preservative,
 Special

TABLE OF CAPACITIES AND LUBRICANTS TO BE USED

| UNIT | CAPACITY (Approx.) | EXPECTED ATMOSPHERIC TEMPERATURE | | |
|--|-----------------------|----------------------------------|----------------|--------------------------|
| | | ABOVE +32°F. | +32°F. TO 0°F. | BELOW 0°F. |
| Crankcase | 22 U.S. Qts. | OE SAE-30 | OE SAE-10 | Refer to EFSB-L-1000D |
| Transmission | 30 U.S. Qts. | GO | GO | |
| Final Drive (each unit) | 5 U.S. Qts. | SAE-90 | SAE-80 | |
| HIGH TEMPERATURE: Above +90°F. — refer to EFSB-L-1000E | | | | |

| UNIT | EXPECTED ATMOSPHERIC TEMPERATURE | | |
|---|----------------------------------|----------------|--------------------------|
| | +32°F. AND ABOVE | +32°F. TO 0°F. | BELOW 0°F. |
| Track Rollers and Idlers and Front Idlers | GO SAE-90 (Note below) | GO SAE-80 | Refer to EFSB-L-1000D |
| NOTE: If difficulty is experienced with excessive leakage, at operating temperatures +75°F. and above, use "CG" General purpose grease No. 0 or at extreme operating temperatures above 100°F. use "CG" General purpose grease No. 1. | | | |

ADDITIONAL LUBRICATION AND SERVICE INSTRUCTIONS ON INDIVIDUAL UNITS AND PARTS

COLD WEATHER: For Lubrication and Service below 0°F., refer to EFSB-L-1000D

HIGH TEMPERATURE: For Lubrication and Service above +90°F., refer to EFSB-L-1000E

NOTES

- INJECTION PUMP AND GOVERNOR:** (FOR BOSCH PUMPS: *Every 128 hours* drain pump housing and refill to level cock.) (Capacity: $\frac{3}{8}$ U.S. Pint.)
- MAGNETO BREAKER ARM RUBBING BLOCK:** *Every 512 hours* pack small quantity WB2 grease back of breaker arm rubbing block and in recess in breaker post.
- CRANKCASE:** *Every 8 hours* check and fill to full level. *Every 128 hours* drain, when engine is hot. Clean oil strainer screen in oil filler cover. Refill to "FULL" mark on gage. Run engine a few minutes and recheck oil level. Remove cover in guard to reach crankcase drain plug.
- FUEL FILTER:** Remove and wash both metallic and cloth elements; also take water trap apart and clean.
- OIL FILTERS:** Remove and renew elements when changing OE engine oil. After renewing elements, refill crankcase to "FULL" mark on gage. Run engine a few minutes and recheck oil level.
- AIR CLEANER:** *Every 8 hours* clean and refill oil reservoir to level mark with OE engine oil. (Capacity $6\frac{3}{4}$ U.S. Pints.) *Every 64 hours* clean air cleaner lower screen. Keep all connections tight and intake pipe and outer screen clean.
- GEAR CASES:** *Every 128 hours*, with tractor on level ground, check oil level and add lubricant, if necessary. *Every 1024 hours* drain and refill. When draining, drain immediately after operation.
- MUD AND DEEP WATER OPERATION:** *Every 4 hours* lubricate track rollers. **CAUTION!** Be sure that solid pipe plugs are in engine and steering clutch compartments. *Every 64 hours* remove plugs to drain any accumulated oil.
- STEERING CLUTCH PILOT BEARING:** Fittings reached by removing two round plates at rear of main frame. Move tractor to align fittings with holes.
- FITTINGS:** Clean before applying lubricant. **CAUTION!** Lubricate track rollers, idlers and frame points after washing tractor.
- MISCELLANEOUS POINTS OF LUBRICATION:** *Every 64 hours* lubricate throttle connections, clutch and brake linkage with OE engine oil.
- POINTS TO BE LUBRICATED BY MAINTENANCE PERSONNEL AT TIME OF GENERAL OVERHAUL:**
Starting motor reduction gear compartment.
- BUTTON-HEAD TYPE FITTINGS:** Fill with lubricant (see table above) until increased resistance is felt on lever of IHC bucket-type lubricator.
- CLEANING FLUID:** Use Diesel Fuel; Solvent, dry cleaning; or Kerosene.

OPERATIONS SECTION

MEMORANDA

OPERATIONS SECTION

TRACK ASSEMBLIES

If the track chain is too loose it may have a tendency to climb the sprocket when backing the tractor.

When the track adjustment is either too tight or too loose, it causes undue wear on the track links, pins, bushings and bearings, and also on the front idler bearings.

The two heavy coil springs in each track frame are properly set at the factory and require no adjustment. Their purpose is to allow the front idler to recoil under shock but exert no tension on the track when in normal operating position.

On a new unit check the track shoe bolts every 8 hours of operation until it becomes evident that set has taken place. The evidence of set having taken place can be determined when the bolts retain a tightness of 240 to 250 ft. - lbs. The bolts used for attaching the track shoes to the tracks are heat-treated alloy bolts and they will stand considerable tightening strain (common bolts should not be used.)

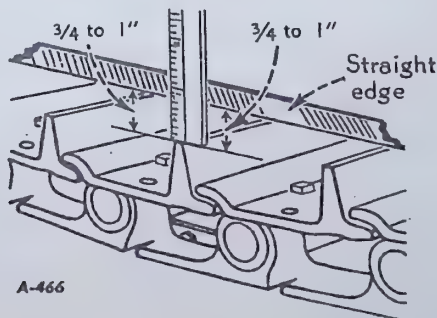
While tightening the bolts it is well to strike the head of the bolt several sharp hammer blows and retighten. As a safety measure

we recommend you use goggles to protect your eyes while striking the bolts.

METHOD OF CHECKING SLACK IN TRACK CHAIN

To check the slack in the track chain, the chain must be tight everywhere except on the top, between the front idler and the sprocket. This can be accomplished by placing a wooden block, approximately one foot in height, under the foremost track shoe lug; then, with the engine running, put the tractor in low gear and engage the clutch just enough so the sprocket drive tightens the chain along the ground and around the sprocket. After locking the brake and stopping the engine, stand on top of the track chain. Your weight will pull the chain tight around the front idler. All the slack should now be in the top part of the track chain.

Using a string or a straight edge align the tips of the track shoe cleats across each of the three spans between the top idlers and sprocket and front idler. The sag of the chain under the straight edge of each span should be approximately $\frac{3}{4}$ to 1-inch. (See Illustr. 1).



Illustr. 1
Method of Checking Slack in Track Chain.

OPERATIONS SECTION

TRACK ASSEMBLIES

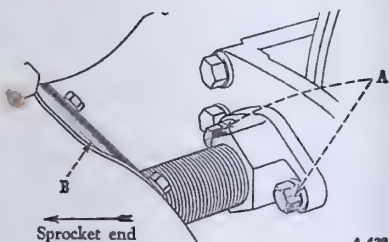
TO ADJUST TRACK CHAIN

(See Illust. 2)

If adjustment is necessary, remove the small cover plate "B" at the front of the equalizer spring housing and loosen the track spring adjuster lock bolt just inside the housing. Remove the two cap screws "A" at the front of the track spring adjuster. Turn the adjuster clockwise, as viewed from rear (sprocket end); this pushes the front idler forward, tightening track chain. Turn the adjuster counterclockwise to loosen the track chain.

After the correct adjustment has been obtained, replace the cap screws "A", tighten the lock bolt and replace the cover plate "B".

After the track chain has been thoroughly broken in it is well to check the slack and adjust it if necessary.



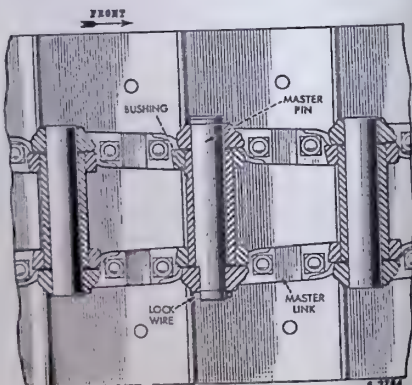
Illust. 2
Adjusting Track Chain.

REMOVING THE TRACK

To remove the entire track from the tractor, drive the tractor forward until the track link master pin is in the front of the front idler. The tractor should be level when removing the track chain. Loosen the tension in the track chain by turning the adjuster counterclockwise as described under "TO ADJUST TRACK CHAIN".

Remove the track link master pin by removing the master pin lock wire and driving out the master pin (See Illust. 4). Run the tractor backward until it is at the end of the track. Place a plank flush against the rear of the track when the track is flat on the ground as shown in Illust. 5. The plank should be approximately the same thickness as the track, narrow enough to fit between the track frame shields, and long enough so the entire tractor can rest of the plank. Now, back the tractor off the tracks and on to the plank.

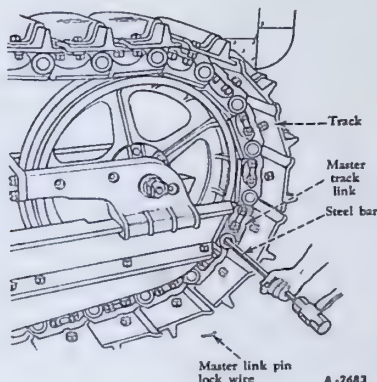
NOTE: If it is desired to replace the old track with a new one, remove the old track as mentioned previously and place the new track flush against rear of the old track when the track is flat on the ground.



Illust. 3
Track Link Master Pin Assembly.

OPERATIONS SECTION

REMOVING THE TRACK - Continued



Illustr. 4
Master Link Pin Removal

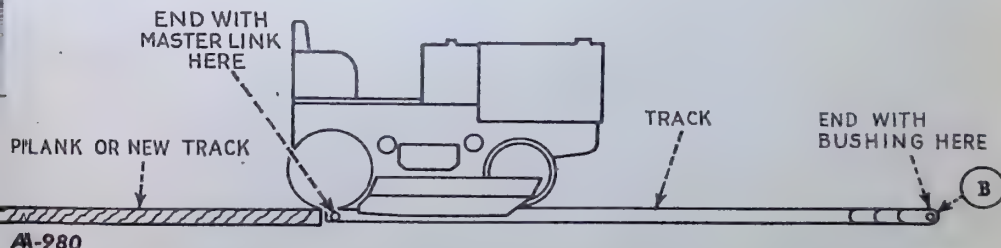
When replacing the track, place the track flush against the plank. The end with the bushing should be in the position shown in *Illustr. 5*. Run the tractor forward on to the track until the sprocket is slightly ahead of the rear end of the track. Put a crowbar through the master pin hole and pull track up around the sprocket and forward over the track idlers and front idlers as the tractor is driven forward.

CAUTION; Drive the tractor forward in low speed with the engine speed control lever in the idle position and ride the brakes so that the tractor does not go too fast.

Place a block (about 8 to 10 inches high) under the cleat of the shoe on the last link of the track at "B", *Illustr. 5*, to hold the track against the idler. Engage the engine clutch and apply just enough power in forward speed to take the slack out of the bottom part of the track. Then, replace the master pin and the lockwire. Adjust the tension in the track chain as described on page 1,

TRACK ROLLER LUBRICATION

It is important that the track rollers have the proper lubrication. (See "Lubrication Guide" for further information).



Illustr. 5

OPERATIONS SECTION

MEMORANDA

TracTracTor Model TD-18

REPAIR SECTION

The various assemblies in this tractor are arranged alphabetically, in sections, according to their function.

Each section has a black tab which lines up with the corresponding section name and number shown at the right. The black tabs are quickly located by bending this book back.

The contents of each section can be determined at a glance by referring to the index on the other side of this page.

NOTE: Refer to Section 14, page 1, for important note on tolerances clearances and oil seals.

| | |
|--------------------|----|
| COOLING SYSTEM | 1 |
| ELECTRICAL | 2 |
| ENGINE | 3 |
| ENGINE CLUTCH | 4 |
| FINAL DRIVE | 5 |
| FRAME | 6 |
| FUEL SYSTEM | 7 |
| POWER TAKE-OFF | 8 |
| POWER TRAIN | 9 |
| STARTING SYSTEM | 10 |
| STEERING MECHANISM | 11 |
| TRACK | 12 |
| TRANSMISSION | 13 |
| SERVICE CHARTS | 14 |

REPAIR SECTION

CONTENTS

| | Page No. | | Page No. |
|------------------------------------|--------------|---|----------|
| COOLING SYSTEM | | Track frame pivot..... | 6 |
| Fan..... | 1, 2 | Track frame and spring..... | 3, 4 |
| Radiator..... | 1, 4, 5, 6 | | |
| Thermostat..... | 1, 2 | FUEL SYSTEM | |
| Water pump..... | 1 to 4 | Fuel injection pump..... | 2 to 20 |
| | | Injection nozzles..... | 1, 2 |
| ELECTRICAL | | | |
| Fan idler pulley..... | 17, 18 | POWER TAKE-OFF | |
| Generator and relay..... | 18 to 21 | Belt pulley..... | 6 to 9 |
| Magneto..... | 1 to 17 | Front power take-off coupling..... | 1, 2, 3 |
| Starting motor..... | 21 to 23 | Rear power take-off..... | 3 |
| | | Reduced speed power take-off..... | 4 to 6 |
| ENGINE | | | |
| Air cleaner..... | 1 | POWER TRAIN | |
| Camshaft..... | 6, 7, 12, 13 | Line of power..... | 1 |
| Connecting rods..... | 14 to 17 | | |
| Crankcase..... | 20, 21, 22 | STARTING SYSTEM | |
| Crankcase front cover..... | 22, 23 | Adjustment of starting control mechanism..... | 2, 3, 4 |
| Crankshaft..... | 16 to 19 | Carburetor..... | 5 to 8 |
| Cylinder head..... | 5 to 9 | Intake manifold..... | 4, 5, 6 |
| Cylinder sleeves..... | 16 to 18 | Operation..... | 1, 2 |
| Injection pump drive..... | 24 | Spark plugs..... | 7 |
| Lubrication..... | 1, 2, 3 | Starting carburetor..... | 6 to 9 |
| Magneto drive..... | 25 | | |
| Manifold..... | 1 | STEERING MECHANISM | |
| Oil filters..... | 2 | Steering brakes..... | 4, 5 |
| Oil pump..... | 3, 4, 5 | Steering clutches..... | 1 to 4 |
| Pistons..... | 16 to 18 | | |
| Starting mechanism..... | 11 | TRACK | |
| Timing gears..... | 23 | Front idlers..... | 6 to 8 |
| Valves..... | 6 to 12 | Track chain..... | 1, 2 |
| | | Track idlers..... | 4, 5 |
| ENGINE CLUTCH | | Track rollers..... | 2 to 4 |
| Engine clutch and connections..... | 1 to 5 | | |
| FINAL DRIVE | | TRANSMISSION | 1 to 5 |
| Drive bevel gear..... | 1 to 3 | | |
| Sprockets and sprocket drive..... | 4 to 7 | SERVICE CHARTS | |
| FRAME | | Engine..... | ..... |
| Equalizer spring..... | 8, 9 | Final drive..... | ..... |
| Main frame..... | 1 | Tractor..... | ..... |
| Rigid track frame..... | 9, 10 | | |
| Track frame..... | 2 to 6 | | |
| Track frame diagonal brace..... | 7 | | |
| Track frame guide..... | 5, 6 | | |

REPAIR SECTION

COOLING SYSTEM**Specifications**

| | |
|-------------------------------------|------------------------------|
| Type | Centrifugal Pump Circulation |
| Radiator | IHC Flat Tube |
| Thermostats, open at | 165° |
| Thermostats, wide open at | 190° |
| "V" Belt | Adjust by moving the idler |
| Capacity, U.S. Gallons | 27 |
| Water pump capacity, G.P.M. | 80 |
| Fan diameter, inches | 24 |
| Fan blades, number | 4 |
| Fan, R.P.M. | 1668 |

Water Pump

A positive centrifugal pump circulates water in a closed system between the engine block, cylinder head, and radiator. The temperature is controlled by two thermostats of the bypass type which are set in a casting attached to the front of the cylinder head. The path of water circulation when the engine is cool is from the radiator bottom, up through the water pump, through the engine block, up through the cylinder head, and out into the thermostat assembly. Then it flows through the thermostats and is bypassed back into the pump. Any water escaping into the radiator is made up from the supply at the bottom of the radiator. This circulation during the warm-up period prevents the formation of steam pockets.

The thermostats open at 165° F. The temperature controls the amount of opening of the thermostats which in turn controls the amount of water recirculated through the pump and also the amount of cooler water added from the radiator. With the thermostats wide open at 190° F. the bypass is closed and no water is recirculated through the pump. The flow is then from the cylinder

head through the radiator and back to the pump.

The fan assembly and idler pulley run on ball bearings mounted on the sleeve which is a press fit in the water pump body. The impeller is driven through a full-floating-type shaft. The radiator need not be removed to remove the water pump.

Refer to the "Operations Section" for tightening packing, replacing packing, and adjusting fan belt tension.

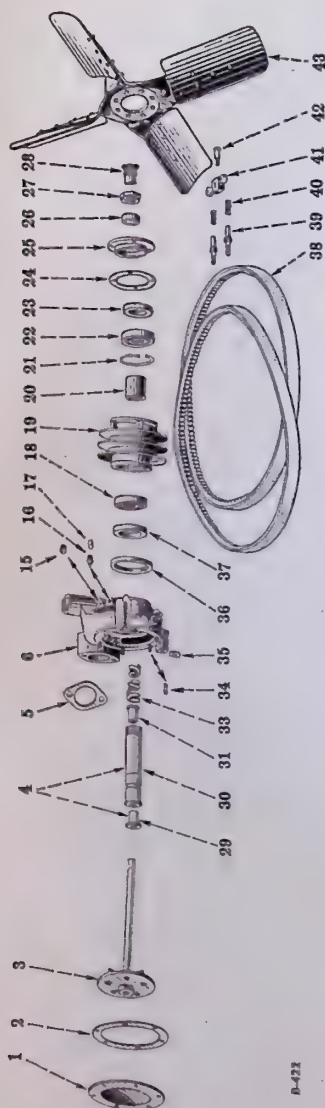
Removal of the Water Pump

Be sure to drain the water before removing the water pump. Then use off the generator heat shield. After the nut on the pump driver pin (42), *Illust. 1*, is taken off, the pin can be pushed out. The driver arm and springs at each end then come off. Remove the four cap screws to take the fan blades (43) off. Loosen the generator and push it against the engine block to slacken the belts. Loosen the hose connection clamps and take out the two cap screws and then remove the bottom bolt. With the pump ready to come off, pull it down and lift it out.

REPAIR SECTION

COOLING SYSTEM - Continued

Water Pump



Illustr. 1
Exploded View of the Water Pump.

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|----------------------------|----------|-----------------------------|----------|-------------------------------|
| 1 | Pump body cover. | 18 | Pump ball bearing. | 26 | Bearing lock |
| 2 | Pump body cover gasket. | 19 | Pump pulley. | 27 | ' sleeve. |
| 3 | Shaft and sleeve assembly. | 20 | Pump bearing spacer. | 28 | Fan pulley bearing clamp nut. |
| 4 | | 21 | Pump bearing retainer ring. | 29 | Pump packing gland. |
| 5 | Pump body gasket. | 22 | Pump ball bearing. | 30 | Pump shaft thrust bushing. |
| 6 | Pump body, complete. | 23 | Oil seal. | 31 | Pump shaft sleeve. |
| 15 | Lubricator. | 24 | Bearing retainer gasket. | 32 | Pump shaft bushing. |
| 16 | Lubricator with cap. | 25 | Bearing retainer. | 33 | Pump packing. |
| 34 | | 34 | Pump body cover stud. | 35 | Pump body spacer. |
| 35 | | 35 | Pump body spacer. | 36 | Pump felt washer. |
| 36 | | 36 | Pump felt washer. | 37 | Oil seal. |
| 37 | | 37 | Oil seal. | 38 | Fan belt. |
| 38 | | 38 | Fan belt. | 39 | Pump driving stud. |
| 39 | | 39 | Pump driving stud. | 40 | Pump drive spring. |
| 40 | | 40 | Pump drive spring. | 41 | Pump driver. |
| 41 | | 41 | Pump driver. | 42 | Driver pin. |
| 42 | | 42 | Driver pin. | 43 | Fan assembly. |
| 43 | | 43 | Fan assembly. | | |

REPAIR SECTION

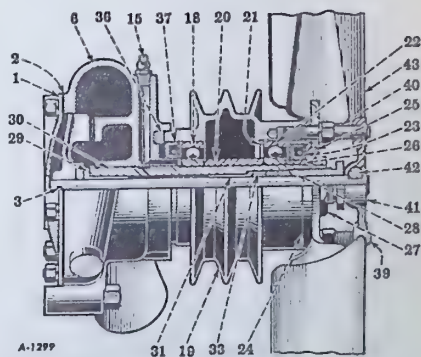
COOLING SYSTEM - Continued

Disassembly of the Water Pump

To remove the pump impeller (3), *Illust. 1*, take out the stud nuts to remove the pump body cover (1) and the gasket (2). Remove the nut from the tapered driver pin (42) and push it out of the driver (41). Then slide off the driver and the drive spring (40). Unscrew the two pump driving studs (39) and two 3/8" cap screws. The pump impeller (3) can then be slid out the opposite end of the pump.

To disassemble the pulley assembly, unscrew the pump packing gland (28) with a water pump wrench. The pump packing (33) can then be removed from the pump shaft sleeve (4). (At this stage the pump packing could be replaced without proceeding further.) Remove the bearing retainer (25), and the gasket (24). Unscrew the fan pulley bearing clamp nut (27). Then the assembly (18), (19), (20), (21), (22), (23), and (37) can be pulled off the sleeve assembly (4). In doing so, care must be taken to work against the hub and not the flange.

Push the bearing spacer (20) to one side so that the bearing (18) and oil seal (37) can be removed. Then the bearing (22) and the oil seal (23) can be forced out of the pump pulley (19). The snap ring (pump bearing retainer ring) (21) prevents the bearing (22) from moving to the rear. If the snap ring is taken out of the pulley (19), be sure to replace it when reassembling. The pump shaft sleeve (30) can be pushed from the pump body (6). If desired, the pump shaft thrust bushings (29) and (31) may be driven out.



Illust. 2
Cross Section of the Water Pump

1. Pump Body Cover; 2. Pump Body Cover Gasket; 3. Pump Impeller with Shaft; 6. Pump Body; 15. Lubricator Fitting; 18. Rear Ball Bearing; 19. Pump Pulley; 20. Pump Bearing Spacer; 21. Bearing Retainer Ring; 22. Front Ball Bearing; 23. Front Oil Seal; 24. Bearing Retainer Gasket; 25. Bearing Retainer; 26. Bearing Lock Sleeve; 27. Fan Pulley Bearing Clamp Nut; 28. Pump Packing Gland; 29. Pump Shaft Thrust Bushing; 30. Pump Shaft Sleeve; 31. Pump Shaft Bushing; 33. Pump Packing; 36. Pump Felt Washer; 37. Rear Oil Seal; 39. Pump Driving Stud; 40. Pump Drive Spring; 41. Pump Driver; 42. Pump Driver Pin; 43. Fan Assembly.

REPAIR SECTION

COOLING SYSTEM - Continued

Repair of the Water Pump

The bushings (29) and (31) are furnished reamed to size and need only be pressed in place. The impeller shaft diameter is .6225-inch to .6230-inch. The running clearance of the shaft is .0015-inch to .0025-inch.

Reassembly of the Water Pump

Press the pump shaft thrust bushings (29) and (31) into their respective ends of the pump shaft sleeve (30). Then press the sleeve into the pump body (6). The felt washer (36) can be saturated with oil and placed in the groove in the pump body.

Locate the retainer ring (21) in its groove in the front end of the pump pulley (19), and press the bearing (22) against it. Pack the inside of the pulley with grease, set the bearing spacer (20) in position, and press the bearing (18) into the pulley hub, snug against the spacer. Then press the oil seal (37) into the pulley (19) against the bearing (18) with the lip of the seal facing the bearing.

Support the pump body below the sleeve (30) and press the pump pulley assembly into the sleeve. Press on the inner race of the bearing only. Slide the bearing lock sleeve (26) over the sleeve (30) and against the bearing (22). Press the oil seal (23) into the bearing retainer (25) so the lip of the seal will not face the bearing (22). Attach the gasket (24) to the retainer (25) and assemble the retainer to the pump pulley (19). Use two opposite cap screws. Turn the bearing clamp nut (27) on the sleeve (30) and tighten.

Slide the impeller (3) into the sleeve (30) and fasten the body cover (1) with the gasket (2) in place. Slide the packing (33) over the front end of the impeller shaft. Replacement packing is in three segments within the same package. Tap the packing down in

place and run up the packing gland (28). Tighten this gland after the pump is attached to the engine and after it has had an opportunity to run in. Then tighten only sufficiently to stop the pump from leaking. Remove cap screws from the bearing retainer (25).

Replacement of the Water Pump

The water pump can be replaced in the reverse order of removal. Be sure all gaskets are new and in place when bolting the pump to the crankcase and head. Assemble the fan belts and attach the generator heat shield. Attach the fan (43) with the regular cap screws (opposite one another) and the two driving studs (39). With springs (40) in place, push on the pump driver (41), and insert the driver pin (42). Attach the nut to the pin.

Radiator

Removal of the Radiator

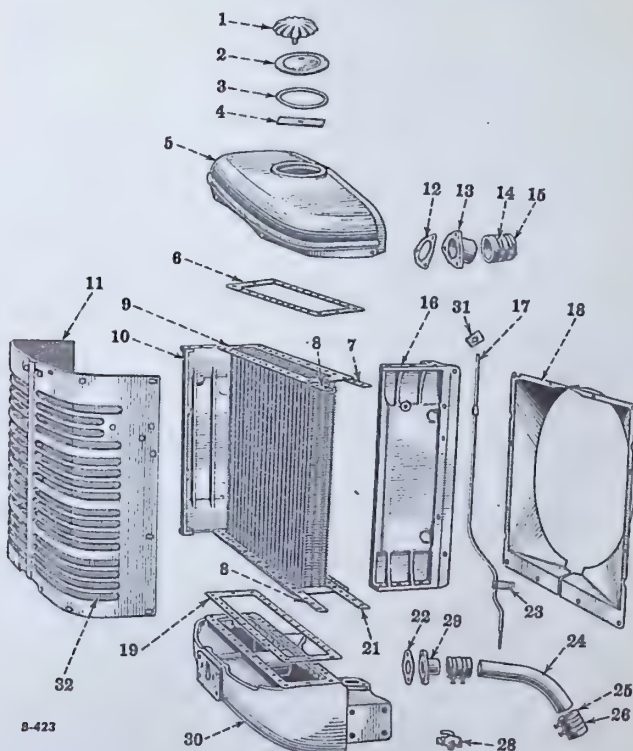
The water must be drained from the system before removing the radiator. Then remove the engine top sheet and disconnect the head lamp at the head lamp junction block. The junction is located on the lower right side of the radiator. Disconnect the water hoses (15) and (25), *Illust. 3*, at clamps (14) and (26). Close the gasoline shut-off valve under the starting fuel tank attached to the radiator. Disconnect the fuel line from the tank to the carburetor and remove the gasoline tank from the radiator. Remove the radiator guard and then the radiator grille (11) and (32) complete.

Place a rope sling around the radiator and attach it to the lifting unit; or block up the radiator and pull the tractor away from the radiator. If a hoist is used, slide the lower water tank from the ends of the main frame side channels. The tank complete weighs approximately 460 lbs. so be sure the material used will be strong enough to handle the load.

REPAIR SECTION

COOLING SYSTEM - Continued

Radiator



Illustr. 3
Exploded View of the Radiator.

| Ref. No. | Description | Ref. No. | Description |
|----------|------------------------------|----------|------------------------------|
| 1 | Handle. | 17 | Overflow pipe. |
| 2 | Cover. | 18 | Sheet, left hand. |
| 3 | Gasket. | 18 | Sheet, right hand. |
| 4 | Clamp. | 19 | Gasket. |
| 5 | Water tank, upper. | 21 | Core stiffener, lower, rear. |
| 6 | Gasket. | 22 | Outlet elbow gasket. |
| 7 | Core stiffener, upper, rear. | 23 | Pipe clip. |
| 8 | Core stiffener, front. | 24 | Outlet pipe. |
| 9 | Core. | 25 | Outlet hose. |
| 10 | Core spacer, right hand. | 26 | Outlet hose clamp. |
| 11 | Grille. | 28 | Drain cock. |
| 12 | Elbow gasket. | 29 | Outlet flange. |
| 13 | Inlet elbow. | 30 | Water tank, lower. |
| 14 | Inlet hose clamp. | 31 | Overflow pipe gasket. |
| 15 | Inlet hose. | 32 | Grille screen. |
| 16 | Core spacer, left hand. | | |

REPAIR SECTION

COOLING SYSTEM - Continued

Disassembly of the Radiator

Remove the sheet (18), *Illust. 3*, from the rear side of the radiator assembly. The upper water tank (5) can be removed by taking out cap screws in the core spacers (10) and (16) and also by removing the cap screws from the core stiffeners (7) and (8).

The lower water tank (30) can be removed the same way. The outlet flange (29) is held to the lower water tank by two cap screws.

The core (9) can be reassembled to the water tanks by reversing the above procedure. The overflow pipe

(17) is attached with a fitting to the upper water tank (5).

Reassembly of the Radiator

Reassembly of the radiator is the reverse of disassembly.

Replacement of the Radiator

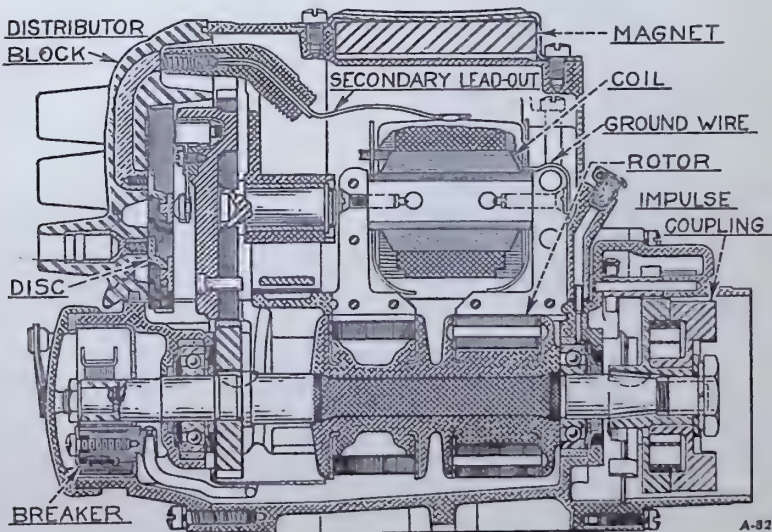
Replacement of the radiator on the tractor is the reverse of the removal from the tractor. Where front power take-off is used, refer to that heading in Section 8.

REPAIR SECTION

ELECTRICAL SYSTEM

Ignition System

| | |
|------------------------------------|------------------------------|
| Magneto Model. | International Harvester F-6 |
| Rotation | Clockwise |
| Magneto Grounding Switch | Automatic in Manifold |
| Breaker Point Gap. | .020-inch |
| Spark Advance. | 15° |
| Impulse Coupling Advance | T. D. C. |
| Magneto Gear, Helical. | 36 Teeth |
| Magneto Gear Idler | 27 Teeth |
| Drive. | Camshaft |
| Spark Plug Size. | 7/8-inch-18, 15/16-inch Hex. |
| Spark Plug Gap | .035 to .040-inch |
| Firing Order | 1, 5, 3, 6, 2, 4 |



A-326

Illustr. 1
Cross Sectional View of
International F-6 Magneto.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Magneto

The I.H.C. F-6 magneto is of the fixed spark type, incorporating an impulse coupling on the drive end to retard the spark during the starting procedure. The breaker and distributor mechanisms are located at the rear. The coil and condenser are completely enclosed and located below the horseshoe-type magnet.

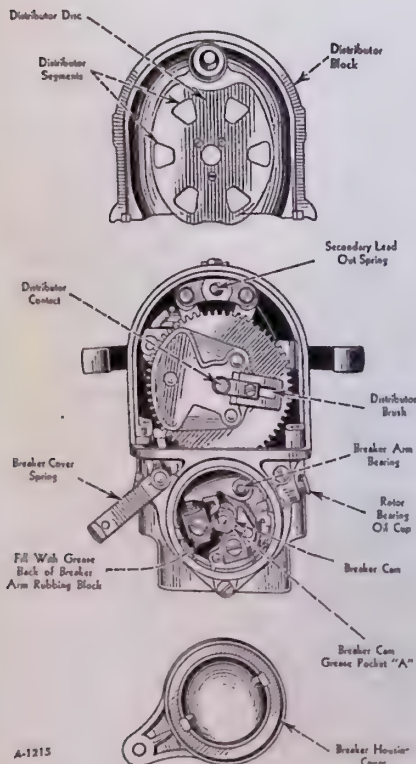
The timing of the magneto to the engine is covered in the "Operations Section".

Service information starts with the breaker mechanism, followed by the distributor, safety gap, coil, condenser, impulse coupling, and finally the rotor. The arrangement is in line with trouble-shooting technique.

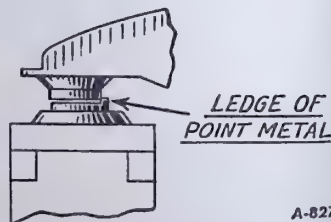
Magneto Circuit Breaker

Preliminary Examination

Remove the breaker housing cover, *Illust. 2*, and examine for correct point performance and setting. A ledge of point metal running up to the side of the companion point, *Illust. 3*, causes a slow break and poor performance.



Illust. 2
Detail of Magneto Distributor
and Breaker Mechanism.

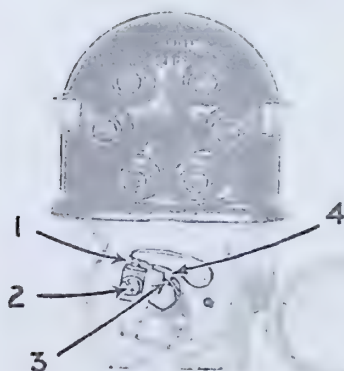


Illust. 3
Ledge of Point Metal Causes a
Slow Break and Poor Performance.

Breaker points on the magneto should be set to .020-inch. To adjust the point opening, slightly loosen the stationary point support screw (2), *Illust. 4*, and use a screw driver as a pry to move the stationary point support. Tighten the screw and check the adjustment.

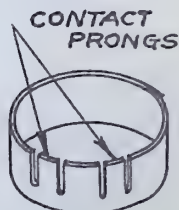
REPAIR SECTION

ELECTRICAL SYSTEM - Continued



Illustr. 4
Breaker Adjustment.

1. Breaker Point Opening; 2. Stationary Point Support Screw; 3. Breaker Cam; 4. Breaker Arm Rubbing Block on High Ridge of Cam.



Illustr. 5
Contact Prongs on the Breaker Cup Should be Bent to Make a Firm Electrical Circuit.

Preliminary Examination - Continued

Examine the breaker for excess oil around the outside and at the bottom. Occasionally, over-oiling may be noticed. This may interfere with the proper primary circuit from the cup member to the breaker housing. The contact prongs of the breaker cup, *Illustr. 5*, are bent out at the factory to make a firm electrical circuit between this cup and the housing in which it fits. Oil interferes with this contact. Likewise, a loose fitting cup produces the same effect. BEND THE PRONGS OUT, if necessary, and reduce the oil supply.

Circuit Breaker Cup Removal

A simple tool for removing the circuit breaker cup may be made from a discarded flat impulse coupling spring.

Bend the spring into a "U" shape and turn a short lip at a right angle on both legs of the "U". These two lips should be long enough to hook in back of the bent over lips on the breaker cup slots which are used to move the cup to advance or retard the spark.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued



A-851

Illustr. 6
How Tool is Used to Remove
Breaker Cup.

1. Breaker Cup; 2. Spring Tool; 3.
Primary Lead-out Terminal Screw.

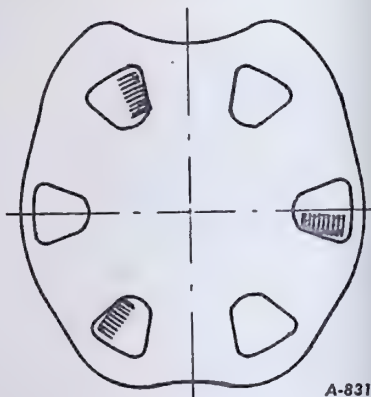
Circuit Breaker Cup Removal - Continued

To remove the breaker cup, first remove the primary lead-out terminal screw (3), *Illustr. 6*. A light blow on the head of this screw after it has been loosened about two turns will free the lead-out terminal and facilitate the breaker cup removal. The breaker cup must be positioned so that the slot in the rear of the cup registers with the pin which is a stop for the advance and retard action. A light pull on the puller, as shown in *Illustr. 6*, will then remove the breaker cup.

Magneto Distributor

Examination

Remove the distributor block, *Illustrs. 1 and 2*. Examine the brush track for black carbon, burns, and for the spot on the bronze insert that tells whether the spark has been occurring at the correct



A-831

Illustr. 7
Correct Timing Spot Mark on
the Distributor Disc.

place. A magneto spark is a rather long drawn-out discharge. It has a tendency to burn the brush track unless the spark is started soon enough to permit a rather complete discharge before the brush runs off the insert and onto the distributor disc surface. The distributor disc brush track can be readily cleaned of black carbon with a soft rubber eraser. Do not use sandpaper.

The sparks of the magneto are of alternate polarity and, therefore, spots each alternate distributor disc insert the same.

Those who are familiar with direct current arc welding readily realize that the direction of current flow has an important bearing on the heat generated when an arc is created in the circuit.

The spark spots should always come on the leading edge of the inserts as shown in *Illustr. 7*, otherwise the distributor disc will burn as the brush leaves at the other side.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Examination - Continued

The disc should be almost completely free of smeared carbon on the brush track, although it may show considerable scratching. This scratching is especially characteristic of the brush stamped (X) on the side. This does not matter so long as the brush track is clean and the disc wear is not excessive.

Distributor Disc

The distributor disc and brushes, *Illust. 2*, should be examined periodically and the disc should be kept clean. The disc can be cleaned with a soft rubber eraser which is free of grit and abrasives and will not scratch disc surface. If the disc becomes badly worn it may be replaced by removing three bakelite screws that hold the disc to the distributor block. When replacing the bakelite pins or screws, the heads should be given a light coat of shellac. This will help prevent them from loosening, and seals them against the possibility of changing shape from the effects of moisture.

When the brushes and the disc are properly related, the brush track will wear very slowly; it will be polished and reasonably smooth. If other than this condition exists, check the gaskets for entrance of moisture or dirt. Be sure the proper brushes are used.

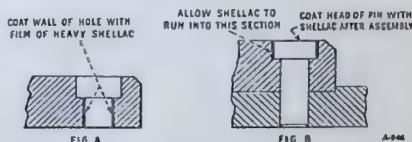


A-832

Illust. 8
Identification
Markings on
National Carbon
Brush Used in
the Magneto.

If the magneto has been operating with the proper spark advance in relation to the distributor gear setting, a slightly blackened condition ("spark spot") will exist on the insert at the leading end of the brush contact. If the magneto has been operating with the spark not properly advanced, this blackened spot will be at the center of the insert. The longest life of the distributor disc can only be secured by the proper timing and the exclusion of all water.

When replacing a distributor disc, the distributor disc pin should first be pushed into place in the disc before final assembly to the gear. Check the clearance between the body diameter of the pin and the hole in the disc. If excessive clearance exists, the disc may eventually come loose after assembly and cause excessive disc and brush wear which may result in faulty performance of the magneto.



Illust. 9
Installing New Distributor
Disc Pin.

To correct such cases where excessive clearance exists, the following procedure should be used. Coat the hole in the disc with a film of heavy shellac as shown in sketch Figure "A", *Illust. 9*. Allow the shellac to dry thoroughly. Place the disc on the gear. Coat the pin with shellac and drive it into place through the disc and into the gear. Be careful not to strike the disc because it may crack readily. Then coat the head of the pin with shellac, allowing same to run into the space between the head and the counterbore in the disc (see

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Distributor Disc - Continued

sketch Figure "B", *Illust. 9*). Wipe off excessive shellac from the face of the disc. Be absolutely certain that no shellac remains in the brush path. This procedure, if carefully followed, will give an assembly which will remain tight indefinitely.

Distributor Brushes

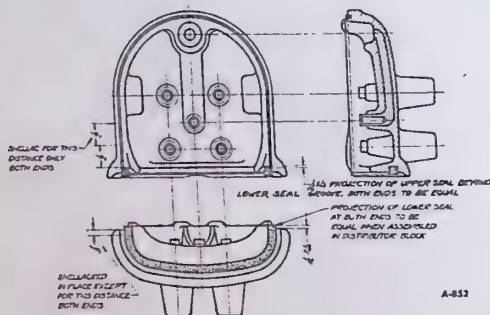
These brushes have to be of the proper material to match the disc they are rubbing against. This material has been worked out for each magneto by test. The brush is the new National Carbon grade, lettered "FK" on the side. (See *Illust. 8*). These brushes run rel-

atively clean and are less aggressive than earlier brushes.

Distributor Block Gaskets

For satisfactory performance of a magneto, water should not be permitted to find its way inside. Magnetos are fitted with distributor block gaskets of waterproof construction. This is being done in two ways, one by waterproofing the felt, and the other by applying a narrow lamination of artificial rubber in the gasket to prevent seepage from working through.

In wet localities, see that these gaskets are used in case ignition troubles are experienced. Assemble them as shown in *Illust. 10*.



A-833

Illust. 10
Proper Method of Assembling
Distributor Block Gaskets.

Keep the outside of the distributor block clean of mud and water. Some soils produce a mud that is a very good conductor of electricity. With the exterior surfaces of the distributor block coated with such material, the electrical losses may readily reach values that jeopardize ignition, especially when starting is attempted.

Safety Gap

If the breaker and distributor of

the magneto are both found to be in good condition, carry the examination further. Leave the distributor block off, advance the spark, disengage the impulse coupling, *Illust. 22*. Then turn the magneto briskly by hand. A spark should jump regularly across the safety gap. This test cannot be made on the F-6 magneto unless the safety gap is reduced from the regular setting of 7/16-inch to 15/32-inch to the test dimension of 9/32-inch to 11/32-inch.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Safety Gap - Continued

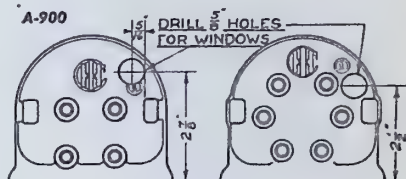
If the spark is still unsatisfactory, intermittent, and weak, the examination must proceed still further. Remove the magnet and frame cover. Check the condenser; put in a new one, if it is available, and test the magneto for spark once more. Also test the condenser as explained under that heading.

The frame cover may be left off for this test; however, it is necessary to replace the magnet on the magneto. The spark should jump the safety gap with the breaker in the advance position with the rotor being turned briskly by hand. If performance is satisfactory, the condenser was at fault. Reset the magneto safety gap to 7/16-inch to 15/32-inch.

Assuming that the condenser exchange did not correct faulty operation, it will be in order to check the primary lead-out wire for open circuit and for grounding. This is done by using the 6-volt line on an electrical test set. Disconnect the primary lead-out wire terminal from the condenser and turn the rotor until the breaker points are open. If the primary lead-out wire shows a closed circuit from the terminal to the screw in the spring anchor, and an open circuit from either terminal to any grounded surface, then the fault lies either in the coil winding or in the coil installation.

High humidity, extreme high temperatures, or high altitudes, or a combination of all three, may cause internal jumping of the spark. If a magneto starts jumping the safety gap, determine the cause and correct it. These gaps are amply long for almost every condition where internal combustion engines are operated, except high altitudes.

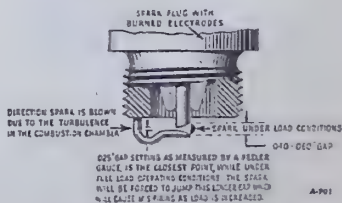
A spark jumping a safety gap can be readily detected by replacing the regular distributor block on the magneto with one in which a transparent window has been provided (Illust. 11). Run the engine



Illust. 11
Hole for Window in Distributor
Block for Observing Spark
Across Safety Gap.

for a sufficient time to permit the air in the magneto to attain the normal operating temperature, and observe through the window if the spark is jumping the safety gap. If it is, check all spark plug gap settings. It may be necessary to file off the spongy metal at the tips of the spark plug wires and close the gap to .020-inch. If the spark still jumps the safety gap, with the engine running, the safety gap may be increased. Cut off and re-form the spark plug lead-out closer to the secondary lead. (See "G", Illust. 13.)

A window, rather than just an opening, must be used; otherwise air conditions in the magneto will change and probably prevent the spark from jumping. Drill holes in the block as shown in Illust. 11; then, with a drill slightly larger in diameter, counterbore the same hole. The window can be made of celluloid to fit the counterbore hole and then cemented in place with shellac.



Illust. 12
Difference Between Actual and
Measured Spark Gap.

REPAIR SECTION

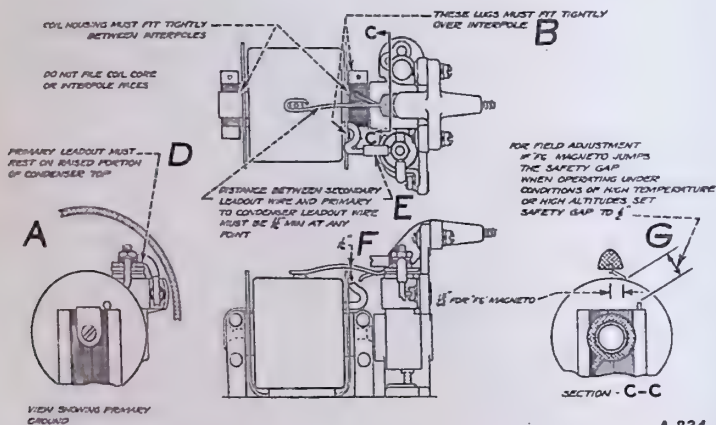
ELECTRICAL SYSTEM - Continued

Safety Gap - Continued

Spark plug electrode wires burn off on one side more than the other because the spark is blown there. Keep the spark plug gap set close (.035-inch to .040-inch). In many cases, even then the spark is jumping .040-inch to .060-inch due to turbulence in the combustion chamber, *Illust. 12*.

If the spark still jumps to the frame cover after re-forming the safety gap, three coats of insulat-

ing varnish may be applied to the inside of the frame cover, allowing sufficient time for drying between each coat. A spaghetti insulator can be slipped over the high tension lead-out, or it may be coated with insulating varnish with the exception of the contact point. Another method is to place a thin sheet of bakelite under the roof of the frame cover. Varnish coating is suggested as an extreme emergency measure for very high altitudes, and should not be done unless absolutely necessary.



Illust. 13

Drawing of Magneto Coil Assembled in Place on the Magneto with Servicing Pointers for Installing Coil Properly.

Magneto Coil

Examination of the Ground Connection

Examine the ground connection of the winding to the interpole, "A", *Illust. 13*. This wire should be securely tightened to the countersunk hole in the interpole.

The coil housing should be a tight press fit between the interpoles endwise, so that it cannot shift and wear loose from engine vibration. If this happens, the ground connection, or the wire to the condenser, will crack in two. A very slight amount of motion will bring this about. Now see that this fault does not exist in the magneto being examined.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Examination of the Ground Connection - Continued

Assuming the spark is still unsatisfactory, it will then be necessary to replace the coil. It must be faulty because everything else has been gradually eliminated as the source of trouble. However, an additional check for faulty coil can be made before removing the coil from magneto.

As a final check for a faulty coil, the coil may be tested while still on the magneto by using an electrical test set. Turn the magneto rotor until breaker points are separated, and remove the primary wire terminal from condenser post. Snap the winding test lead clip on the terminal primary wire to the condenser and the other test lead clip on any grounded part of the magneto. Hold the high tension test point on the secondary lead-out wire. Interrupted primary current should cause the spark to jump the 5/16-inch test gap on the testing set.

In this case, the method of testing the coil while it is still on the magneto is listed for the information it will give. The coil on the test magneto has already been proved faulty by previous checks. The coil should now be removed from the magneto and replaced with a new one.

A-834



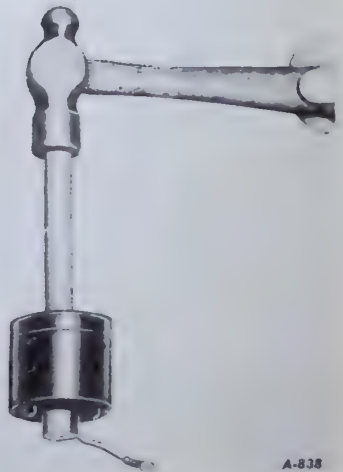
Illustr. 14

Coil Removed from Magneto.

Removal of the Coil

Disconnect the condenser "D", Illustr. 13. Then remove the distributor gear and bearing (1), Illustr. 14. Next, remove the coil core screws. Remove the coil ground wire from the interpole. Force the coil upward slowly with the aid of a screw driver.

The core should always be in position in the center of the windings when testing the coil on the electrical testing instrument. If the core is not in place, the transformer set-up of the coil is not complete and no spark will appear at the gap. This test should not be prolonged any more than is necessary to obtain the check. Subjecting the coil to the test conditions for a prolonged period may damage it.



A-838

Illustr. 15

Removing Coil Core with Hard Wood or Fiber Punch.

1. Distributor gear and Bearing;
2. Coil Core Screw; 3. Coil; 4. Coil Ground Wire; 5. Interpole.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Disassembly of the Coil

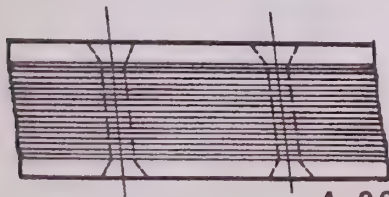
Remove the coil core from the defective winding. Hold the coil in one hand, preferably with the coil lid up. By the use of a flat-end hardwood or fiber punch, at least 5/8-inch to 1 1/16-inch in diameter, drive the core downward between the fingers, *Illust. 15*. Be sure to hold the coil firmly when driving out the core. The bakelite coil case is brittle and will break if dropped. Never use a metal punch of any kind.

Coil Core Fit Between Interpoles

The least defect on the joining surfaces between the coil core and interpole will permanently impair the magneto's operation.

This joint must be a clean "sucking" fit, similar to the fit when two Johanssen gauge blocks are put together. They stick by virtue of their flatness after being properly "wrung" together. No rust, no oil, or foreign matter of any kind must be on these surfaces. Do not try to correct defects by filing the ends of the coil core. This can only end in failure.

The coil core is made of laminated electrical sheet steel. It is held together by two rivets. If struck vigorously with a metal tool, it will burr and may be knocked out of line as shown in *Illust. 16*.



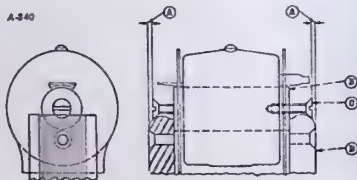
A-839

Illust. 16
Drawing Shows Coil Core
Knocked Out of Square.

The coil must be a tight fit between the interpoles and on the coil core. Otherwise vibration will loosen it and cause failure.

Do not attempt to file the diameter of the coil core so that it will slip into the winding easily, nor file the ends to make it fit between the interpoles easier. Paint the coil hole generously all around with a thick asphalt solution for a 3/8-inch length at each end before pressing in the core. The core should be a hard press fit in the winding and it may have to clear a path by removing a small amount of varnish as it is pressed in; this is permissible and will cause no damage, provided it is started and pressed in straight. Clean the core ends thoroughly of paint. These surfaces must be absolutely clean. The coil should be a hand press fit between the interpoles. The bakelite housing will normally be a little longer than the coil core and should not be filed.

A-840



Illust. 17

Testing Coil Core Screws Before
Assembling Coil and
Core to Magneto.

A. 1/32" Minimum; B. Coil Core; C.
Coil Core Mounting Screw; D. Inter-
pole.

The guide lugs on the coil housing should fit the interpole so that they bear against it lightly, just enough to keep the winding from moving sideways or turning around on the screws. A check should be made on the length of the coil core screws. They should be bottomed

REPAIR SECTION

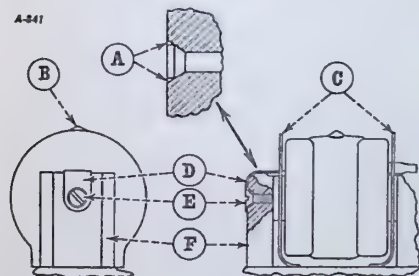
ELECTRICAL SYSTEM - Continued

Coil Core Fit Between Interpoles - Continued

lightly in the core and the winding placed on top of the interpoles with the screws in place (See *Illust. 17*). In this position it can be readily seen whether the screws bottom before they tighten or not. If the guide lugs are too tight on the interpole, they may be filed until they fit properly. Be careful not to touch the end of the core with the file during this operation.

If either screw head does not fall back of the face of pole piece by $1/32$ -inch minimum shown, it must be removed and enough cut off the end to meet this requirement. This is done so that when the coil core is in place, the screws will tighten up in the pole piece countersink before the screws bottom in the coil core.

Caution: Do not file or in any way deface the ends of the coil core or the face of pole pieces as this will impair the magnetic circuit and efficiency of the magneto. The coil core should be a light press fit between the pole pieces.



Illust. 18
Method of Grounding Coil.

A. If Countersunk Hole in Pole Piece Has a Shoulder, Remove it Before Assembling Coil Grounding Strip under Coil Mounting Screw, Otherwise Coil Grounding Strip Will Not Make a Good Contact; B. High Tension Terminal; C. Coil Insulators; D. Coil Grounding Strip; E. Screw; F. Coupling End of Pole Piece.

Assembly of the Coil

Locate the coil and core in the magneto so that high tension terminal "B", *Illust. 18*, is on a vertical center line as shown.

Assemble the coil grounding strip "D" under the coil mounting screw "E" in the pole piece "F" as shown. Tighten the screw firmly. The surface of the countersink in the pole piece and grounding strip must be clean and bright before assembling.

If there is a shoulder in the countersink hole in the pole piece, the shoulder must be removed.

The High Tension Lead-Out

Do not allow this lead-out to touch the bakelite coil housing at any point. Maintain $1/16$ -inch between the secondary lead-out and the coil housing, "F", *Illust. 13*. This is to prevent a drop of moisture from bridging at this place. If this wire is raised too high, the spark will jump upward to the roof of the aluminum cover.

Magneto Condenser

Examination

All metal surfaces contacting the condenser should be thoroughly cleaned to insure a good ground. See that the condenser is pushed down as far as it will go before tightening the clamp. Refer to "E" and "D", *Illust. 13*, for instructions on the proper positioning of the lead wires to the condenser terminal screw. It is very important that these wires be positioned as shown in the illustration to prevent "shorting" or "grounding". The condenser furnished for replacement does not include the condenser nut (10-32) which must be obtained separately.

Testing Condenser

A sensitive Neon tube type condenser tester is recommended. This type of tester will conclusively show up defects in the condenser

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Testing Condenser - Continued

that cannot be indicated with ordinary test equipment. Such Neon condenser testers operate on 110-volt A.C. current. A special switch on the box allows for testing at four different voltages, ranging from 100 to 600 volts. To determine the exact condition of any condenser, use only the 100 and 200-volt test settings. The use of the 400 and 600-volt test settings will in no way injure the condenser being tested; neither will the readings of the test be as accurate as when using the two lower voltage settings.

Hold one test point on the condenser terminal and the other on the outer metal housing of the condenser. If infrequent flashes occur in the Neon tube with the switch set on the 200-volt position and the tube flashes only for initial charge with the switch set on the 100-volt position, the condenser will pass satisfactorily. If the condenser gives continuous flashes at 200 volts, it should be discarded even though it tests satisfactorily at 100 volts.

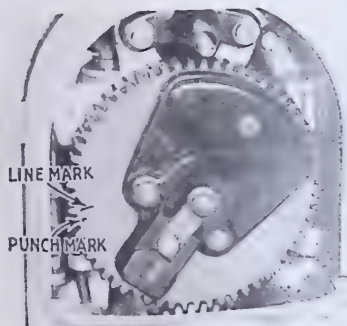
Primary Lead-Out

The primary lead-out fastening and positioning on the condenser end has been described. This wire carries the primary current from the winding to the breaker. It is made of carefully insulated stranded copper wire chosen for its long fatigue life when flexed repeatedly. It is long enough so that the circuit breaker may be removed and examined without disconnecting at the breaker end. When the breaker is replaced, this extra length of wire should be tucked under the primary lead-out shield 21331 D in the magneto frame.

Timing the Distributor Gears

This Diesel engine has the magneto timed for 15° spark advance. The spark is fixed by an external link

on the breaker cover. Use the line mark for timing distributor gears.



Illust. 19

Line Mark Used for Timing
Magneto of 15° Spark Range.

Designating Marks and Special Features

This magneto has the letter "D" stamped on the frame preceding the serial number. Magnet and impulse coupling housing are both painted white. The magneto is fitted with a timing link that provides 15° spark advance measured on the engine crankshaft. It is timed by using the line mark on the distributor gear. It is also fitted with a special main pawl in the impulse coupling and special engaging pawls. These are designed to lower the "throw-out" speed of the coupling and thus insure easier starting.

Distributor Shaft and Bearing

After the distributor gear is properly meshed with the rotor pinion as indicated in Illust. 19, see that the teeth have a very slight amount of clearance so that no radial pressure is exerted on the distributor shaft bearing. Use shims under the bearing bracket, if necessary, to provide this clearance.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued**Distributor Shaft and Bearing
- Continued**

The distributor shaft end play should not be more than .014-inch or less than .003-inch; preferably .003-inch. The reason for this is that excess end play at this point allows the distributor disc to travel back and forth, causing more or less uneven brush pressure and creating excessive wear on the disc brush track. This end play may be adjusted by placing special shim washers Number 12588 C which are .004-inch thick and Number 12589 C which are .008-inch thick, between the retainer spring and the rear thrust washer.

The bushing in the distributor bearing is porous bronze which permits oil to filter through from the oil passage. The passage is supplied with oil from the cup on top of the magneto cover.

Charging the Magnet

Always recharge the magnet during an overhaul.

Magnetizer terminals are usually identified + and -, and must be so connected to a well-charged 6-volt storage battery. The magnet should be inserted into spools from the side indicated with the IHC trade-mark on the magnet on the right. The magnet will then be magnetized in accordance with original factory polarity. If the magnet has no IHC trade-mark, hold it in front of the spools and depress the switch an instant. The magnet is being inserted properly if the magnetizer tends to pull it into the spools.

Push the magnet all the way into the spools and place a keeper over

the ends. Compress the magnetizer switch once or twice for about two seconds. To keep the switch depressed longer, accomplishes no further good, but discharges the battery unnecessarily and heats up the magnetizer.

Slide the keeper downward off the ends of the magnet, pull the magnet from the spools and immediately assemble on the magneto. Never slide the keeper up on the side of the magnet, as this will result in partial demagnetization.

Impulse Coupling

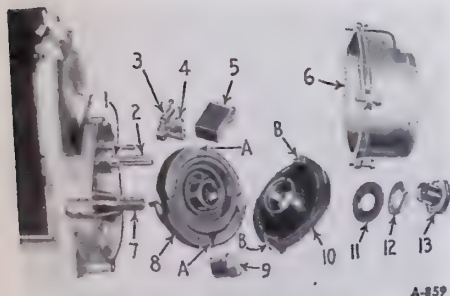
A magneto is capable of delivering suitable sparks at higher speeds; but for slower speeds and for starting, it is necessary to drive the rotor or armature through an impulse coupling. This impulse coupling permits the production of a strong magneto spark at the slowest cranking speeds. The impulse coupling on this magneto is completely automatic and requires no adjustment or manual engaging or disengaging. An occasional cleaning and generous lubrication with light oil is the secret of satisfactory impulse coupling performance.

Operation

The impulse coupling operates as follows: The cam member (10), 11-lust. 20, is locked to the magneto drive shaft on the engine and always rotates steadily at a definite ratio to the engine speed. The magneto member (8), with drive spring and engaging pawls, is keyed to the magneto rotor shaft driving end (7). The cam member and magneto member are connected by a spiral drive spring, shown in magneto member (8).

REPAIR SECTION

ELECTRICAL SYSTEM - Continued



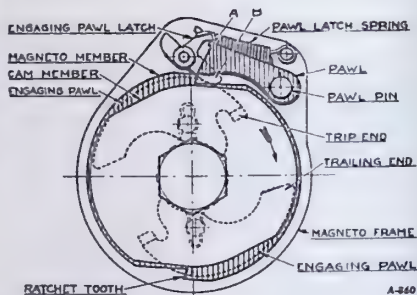
A-859

Illustr. 20
Exploded View of F-6 Type
Impulse Coupling.

1. Pawl Spacer; 2. Pawl Pin; 3. Pawl Latch Spring; 4. Engaging Pawl; 5. Pawl; 6. Coupling Cover; 7. Magneto Rotor Shaft; 8. Magneto Pawls with Engaging Pawls and Spring; 9. Impulse Coupling Puller, SE-912; 10. Cam Member; 11. Washer; 12. Lock; 13. Coupling Nut.

Operation - Continued

As the cam member and magneto member rotate slowly, a pawl (5), which pivots on a pawl pin (2) mounted to the magneto frame, engages in the upper ratchet slowly in the magneto member and prevents the magneto member from turning. The cam member continues to turn and winds up the drive spring for approximately 46°. The pawl is then tripped from the ratchet slot by cam member (1). The spiral drive spring unwinds, hurling the magneto member unit and rotor rapidly forward until the end of milled slots (A) in the magneto member strike lugs (B) on the cam member. The complete coupling will then rotate at the same speed, as a unit, until the pawl catches on the following ratchet slot. There are four equally spaced ratchet slots in the magneto member of the magneto coupling. Tripping of the pawls is timed to cause a spark to occur between top dead center position to 8° after dead center, provided the magneto is timed cor-



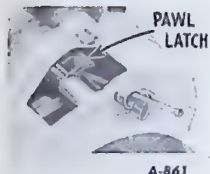
Illustr. 21
End View Drawing of Impulse
Coupling.

rectly to the engine.

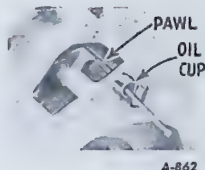
The impulse coupling is designed to automatically throw out at 130 to 200 R.P.M. As the speed of the impulse coupling increases, the cam member disengages the pawl from the ratchet teeth with greater force. When the throw-out speed is reached, the pawl is thrown high enough to catch the latch tip under the pawl ledge "A", *Illustr. 21*. In this position, the pawl is supported out of engagement and the coupling rotates as a single unit, turning the magneto rotor at a steady speed with the engine. When the impulse coupling speed is reduced to between 125 to 145 R.P.M., the coupling automatically comes into operation again. As the throw-in speed is reached, the trailing ends of the engaging pawls, which are the heavier, drop down on the magneto member hub when passing over the center of rotation. By so doing, the trip ends raise to a position where they will strike the lower arm of the engaging pawl latch "B", releasing the

REPAIR SECTION

ELECTRICAL SYSTEM - Continued



Illust. 22
Shows How Main
Pawl Can be
Lifted,
Disengaging the
Impulse
Coupling for
Free Rotation
During Timing.



Illust. 23
Shows How Latch
Is Tripped,
Allowing Pawl
to Drop in
Operating
Position.

Operation - Continued

latch from the pawl. The pawl then drops into working position and the impulse coupling is again in operation.

Release of Impulse Coupling

By manipulating a light finishing nail through the oil cup as shown in *Illusts. 22 and 23*, the pawl may be lifted for free rotation during timing.

By placing the nail in the position shown in *Illust. 22*, and prying downward on the outer end, the pawl may be lifted and the latch will hold it up. It may be necessary to turn the rotor (or rotate the magneto) to a point just past the trip of the impulse to accomplish the lifting of the pawl. If the pawl is in the low position, and the impulse spring is partly wound up, it will be impossible to move it with the nail.

To return the pawl to the operating position, place the nail in the position as shown in *Illust. 23*, and press down on the outer end of the nail to lift the latch.

Removal of the Impulse Coupling

To remove the coupling member (6), *Illust. 24*, start puller (9), *Illust. 20*, in the threads. Then lock the member (6) with the pawl (7), *Illust. 24*, and screw the puller in until considerable effort is required to turn it. If the impulse has been allowed to stand or operate without sufficient oil, the

coupling member (6) is likely to be rusted and stuck on the shaft. It may be necessary to use two screw drivers, one from each side, between the coupling and the magneto frame, and to hit the puller (9), *Illust. 20*, a rather hard blow while at the same time exerting pressure on the screw drivers. Care must be used when this condition exists to remove the member without damaging the threads or the magneto frame.

Disassembly of the Impulse Coupling

To separate the cam member from the magneto member, pull outward until the lugs clear, let it unwind about one-half turn, and then remove. The drive spring can be easily pried out with a screw driver. In replacing the spring, first hook it into position at "B", *Illust. 24*, being sure it will wind in the direction shown. Wind the spring into position, using the right hand to push it gradually down and the left hand to hold the wound coils in place.



Illust. 24
Impulse Coupling Dismantled
from the Magneto.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Reassembly of the Impulse Coupling

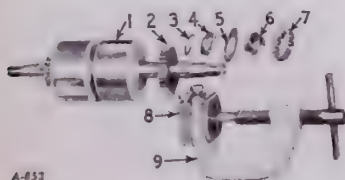
When assembling the coupling be sure that the hub of magneto member (6), is clean and well oiled. If the latch spring (8) is rusty, replace it with a new one. Couplings must be oiled generously with light oil at regular intervals. When the weather is extremely cold, kerosene should be used.

Snap rings hold the engaging pawls to the pawl pins. They must be tight on the pawl pins when in place, otherwise they will wear and fall off. This causes general damage of the magneto frame.

Magneto Rotor

Removal of the Magneto Rotor

To remove the rotor, first remove the impulse coupling. Use puller (9), *Illust. 20*, to avoid injury to the rear of the magneto frame. Then take off the distributor block, magnet, magneto frame cover, distributor disc, bearing assembly, and breaker housing cover. Remove the primary lead-out terminal screw and three breaker housing screws. The breaker housing can then be removed from the magneto frame and the rotor taken from the frame.



Illust. 25
Exploded View of Rotor Parts
with Inner Race Puller Tool,
SE-839.

1. Rotor; 2. Rotor Pinion; 3. Rotor Shims; 4. Rotor Shaft Bearing Spacer; 5. Oil Flinger; 6. Inner Bearing Race; 7. Ball Bearings and Separator Assembly; 8. Bearing Race Adapter; 9. Puller;

The inner bearing race can be readily removed from the rotor by using puller and adapter, (8) and (9), *Illust. 25*. It is necessary to remove the inner bearing race when removing or inserting rotor shims for preloading rotor bearings. Refer to the "Preloading Rotor Bearings" heading.

Removing and Replacing the Magneto Outer Bearing Race

The magneto outer bearing race in both the breaker housing and magneto frame can be readily removed with tool (1), *Illust. 26*. Loosen the expander and insert the tool into the bearing race in the direction shown. Manipulate the split-sleeve flange through the bearing race and hold it against the felt retainer. Now draw up on the expander by applying a wrench to the flats on the threaded end of the expander and turning in an anti-clockwise direction until a definite pressure is felt. Then tighten the hexagon nut, and carefully drive the bearing race from place.

Before replacing the outer bearing races, make sure the felts and retainers are correctly assembled in place. Set the bearing race on the end of a tool such as (2). A small amount of clean grease will hold the race on the tool. Carefully line up the tool over the hole and drive the race into place.

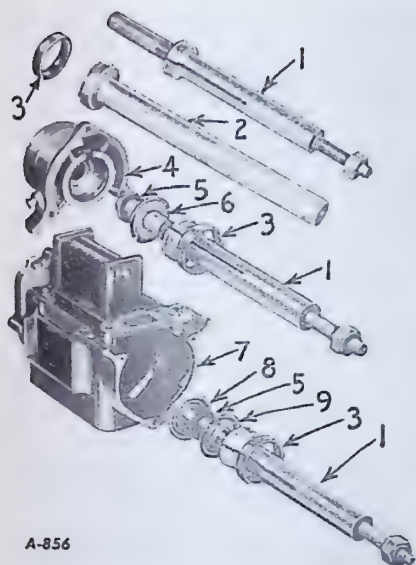
Preloading Rotor Bearings

In order to maintain the high efficiency of this magneto, it is necessary to reduce the air gaps in the magnetic circuit to a minimum. To do this, the rotor clearance is held close. A small amount of end play would allow the rotor to rub, due to the construction of the ball bearings. They are made to take lateral as well as radial load.

To avoid any possibility of the bearings becoming loose, they are preloaded from .000-inch to .002-inch lengthwise. To do this, assemble the rotor with just enough

REPAIR SECTION

ELECTRICAL SYSTEM - Continued



Illustr. 26
Tools Used for Removing and
Replacing Magneto Outer
Bearing Races.

1. Magneto Bearing Race Puller Tool, SE-1020; 2. Magneto Bearing Race Replacer Tool, SE-1021; 3. Outer Bearing Race; 4. Breaker Housing; 5. Felt; 6. Felt Retainer, Breaker Housing End; 7. Frame; 8. Felt Retainer, Outer; 9. Felt Retainer, Inner.

Preloading Rotor Bearings - Continued

shims to set the end play at nothing, or a point where no perceptible play can be felt and still be free. This is to be tried with the rotor in the frame, the bearing housing in place, and all the screws tight. The bearings should be free of grease and oil to get an accurate fit. Then remove the bearing housing, bearing inner race

and flinger, and add one .002-inch or .0025-inch shim. (See *Illust. 25.*) The washer shims should be between the inner race and the gear on the rotor shaft. After this setup is completed, be sure that the shaft does not bind and that the preloading was all done with the last placed shim of .002-inch or .0025-inch. Too much preloading will ruin the bearing. Some relief to these bearings is provided as soon as the magneto starts to warm up on the engine. The aluminum frame expands more rapidly than the steel rotor shaft and thus relieves the preloading to a large degree.

Fan Idler Pulley

To remove the fan idler pulley, take out the two bolts in the idler bracket (5), *Illust. 27.*

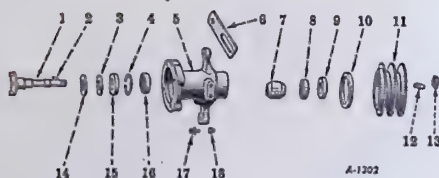
Disassembly of the Fan Idler Pulley

To disassemble the idler, unscrew nut (13) and pull the idler pulley (11) from the fan belt idler shaft (1). Be careful to work on the hub of the idler pulley (11) and not on the flange.

Then replace nut (13) on the shaft and drive it in carefully until the key (2) turns out of the shaft sufficiently to remove it. Remove nut (13) and pull out the fan belt idler shaft (1) from the opposite end. Remove the idler shaft felt (3) and the felt retainer (14). Also remove the idler oil seal (15). Take out the idler bearing lock ring (4) (be sure to replace this when reassembling). The inner bearing (16) is driven out by driving against the inner race of idler bearing (8) until this bearing can be lifted out. Then remove the idler bearing spacer (7). Drive the idler bearing (8) out the opposite direction from where the shaft was removed. The idler oil seal (9) comes out with the bearing (8).

REPAIR SECTION

ELECTRICAL SYSTEM - Continued



Illustr. 27

Exploded View of the Fan Idler Pulley.

1. Idler Shaft; 2. Pulley Key;
3. Shaft Felt; 4. Lock Ring;
5. Idler Bracket; 6. Pulley
- Brace; 7. Bearing Spacer; 8.
- Bearing; 9. Oil Seal; 10. Pul-
- ley Felt; 11. Idler Pulley;
12. Lock Washer; 13. Nut; 14.
- Felt Retainer; 15. Oil Seal;
16. Bearing; 17. Lubricator;
18. Plug.

Reassembly of the Fan Idler Pulley

Reassembly of the fan idler pulley

is the reverse of the disassembly procedure. Tips of the oil seals (9) and (15) face.

Generator and Relay

Generator Specifications

- Rotation -- clockwise, viewing drive end.
- Brush spring tension -- 14 to 18 ounces.
- Maximum cold output -- 8 to 10 amperes at 14.4 to 14.9 volts at 2200 R.P.M.
- Maximum hot output -- 6 to 8 amperes at 14.1 to 14.5 volts at 2400 R.P.M.
- Field current (third brush lifted) -- 1.50 to 1.67 amperes at 12 volts.

Generator and Relay

The Delco-Remy Model 1101724 Generator is a 12-volt, third brush unit with a ball bearing in the drive end and a bronze bushing in the commutator end. A Model 1116810 Cut-Out Relay is mounted on the generator frame.

Maintenance of the Generator

General maintenance may be divid-

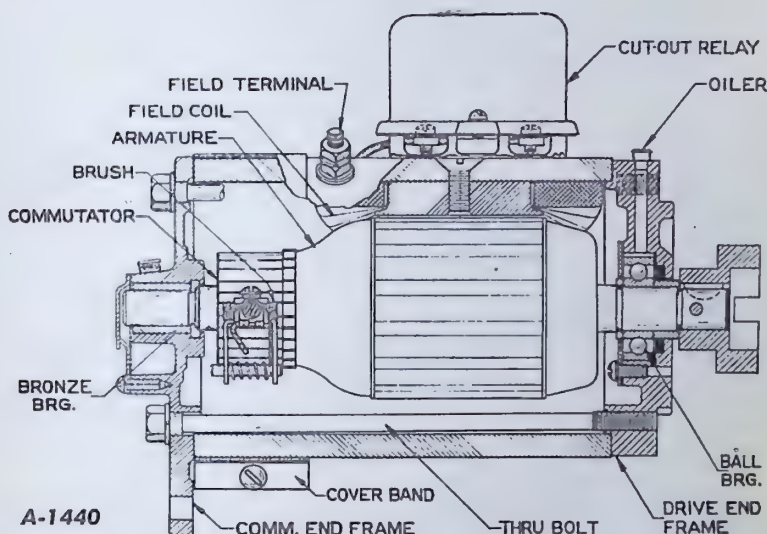
ed into two sections, *normal maintenance* required to assure continued operation of the generator and the *checking and repair* of inoperative generator.

Normal Maintenance of the Generator

Lubrication: The two hinge cap oilers should be supplied with 8 to 10 drops of light engine oil every 60 hours of operation. Do

REPAIR SECTION

ELECTRICAL SYSTEM - Continued



Illustr. 28
Cross Section of Generator.

Normal Maintenance of the Generator - Continued

not oil excessively. Never oil the commutator.

Inspection: The cover band should be removed and the commutator and brushes inspected at regular intervals. If the commutator is dirty, it may be cleaned with No. 00 sandpaper. Blow out dust. **NEVER USE EMERY CLOTH TO CLEAN COMMUTATOR.** If the commutator is rough, out of round, or has high mica, it should be turned down in a lathe and the mica undercut.

Worn brushes should be replaced. They can be seated with a brush seating stone. The brush seating stone is an abrasive material which, held against the revolving commutator, carries under and

seats the brushes in a few seconds. Blow out the dust. **NEVER USE EMERY CLOTH.**

Disassembly of the Generator

At regular intervals, the actual mileage or time depending on the type of operation, the generator should be disassembled for a thorough cleaning and inspection of all parts. Never clean the armature or fields in any degreasing tank, or with grease dissolving materials, since these may damage the insulation. The ball bearing should be cleaned and repacked with a good grade of ball bearing grease. The commutator should be trued in a lathe and the mica undercut if necessary. All wiring and connections should be checked. Rosin flux

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Disassembly of the Generator - Continued

should be used in making all soldered connections. Acid flux must never be used on electrical connections.

Checking an Inoperative Generator

Several conditions may require removal of the generator from the engine and further checking of the generator, as follows:

1. No output.
2. Unsteady or low output.
3. Excessive output.
4. Noisy generator.

1. No Output.

Remove cover band and check for sticking or worn brushes and burned commutator bars. Burned bars, with other bars fairly clean, indicate open circuited coils. If brushes are making good contact with commutator and commutator looks okay, use test leads and light and check as follows:

- a. Raise grounded brush, check with test points from "A" terminal to frame. Light should not light. If it does, the generator is grounded; raise other brush from commutator and check field, commutator and brush holder to locate ground.
- b. If generator is not grounded, check field for open circuit.
- c. If the field is not open, check for shorted field. Field draw at 12 volts should be 1.5 to 1.67 amperes. Excessive current draw indicates shorted field.
- d. If trouble has not yet been located, remove armature

and check on growler for short circuit.

2. Unsteady or Low Output.

Check as follows:

- a. Check drive.
- b. Check brush spring tension and brushes for sticking.
- c. Inspect commutator for roughness, grease and dirt, dirt in slots, high mica, out of round, burned bars. With any of these conditions, the commutator must be turned down in a lathe and mica undercut. In addition, with burned bars which indicate open circuit, the open circuit condition must be eliminated or the armature replaced.

3. Excessive Output.

Excessive output usually results from a grounded generator field - grounded either internally or externally. Opening the field circuit disconnecting lead from "F" terminal of generator with the generator operating at a medium speed will determine if the generator is at fault. If the output drops off, the field is grounded externally. If the output remains high, the field is grounded in the generator, either at the pole shoes, leads, or at the "F" terminals.

4. Noisy Generator.

Noisy generator may be caused by loose mounting, drive unit, worn, dry or dirty bearings, or by improperly seated brushes. Brushes may be seated by using brush seating stone, referred to above.

INSTALLATION CAUTION: After the generator is reinstalled on the engine, or at any time after leads have been disconnected and then reconnected to the genera-

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Checking an Inoperative Generator - Continued

tor, a jumper lead should be connected **MOMENTARILY** between the **BATTERY** and **GENERATOR** terminals of the cut-out relay, *before*

starting the engine. This allows a momentary surge of current from the battery to the generator which correctly polarizes the generator with respect to the battery it is to charge.

Starting Motor Specifications

Clockwise rotation viewing the drive end.

Brush spring tension 2.25 to 2.50 lbs.

No load. 2250 R.P.M. - 75 amperes - 11.25 volts.

Lock torque.55 ft.-lbs. - 700 amperes - 5 volts.

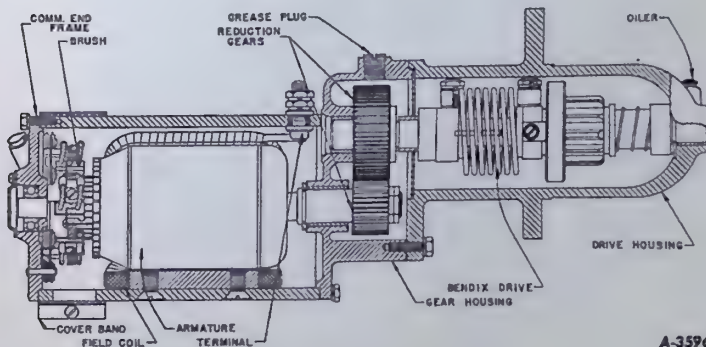
The Delco-Remy Model 756 Starting Motor is a heavy-duty, 12-volt gear-reduction unit with an internal reduction of 1.7 to 1. All bearings are bronze bushings except for a ball bearing in the commutator end. Lubrication is provided for each bearing by dust-proof hinge cap oilers. The Bendix drive, keyed to the drive shaft, automatically engages the cranking pinion with the flywheel ring gear when the armature begins to revolve. When the engine fires, the over-running effect of the flywheel on the pinion disengages it from the flywheel.

Maintenance of the Starting Motor

Starting motor maintenance may be divided into two sections, *normal maintenance* required to assure continued operation of the motor and the *checking and repair of an inoperative starting motor.*

Normal Maintenance of the Starting Motor

Lubrication: Put 8-10 drops of light engine oil in the hinge cap oilers every 250 hours. Do not oil excessively. *Never oil commutator.*



Illustr. 29
Cross Section of Starting Motor.

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Normal Maintenance of the Starting Motor - Continued

The reduction gear case may be repacked with graphite grease every 6 months.

Inspection: The cover band should be removed periodically and the brushes and commutator inspected. If the commutator is dirty, it may be cleaned with No. 00 sandpaper. NEVER USE EMERY CLOTH TO CLEAN COMMUTATOR. If the commutator is rough, out of round, or has high mica, it should be turned down in a lathe and the mica undercut. The mica should be cut away to the depth of 1/32-inch. Worn brushes should be replaced. If brushes wear with excessive rapidity, check for excessive brush spring tension, roughness or high mica of the commutator.

Disassembly of the Starting Motor

At regular intervals, depending on the type of service, the starting motor should be disassembled for cleaning and inspection of all parts. The Bendix drive should be cleaned and oiled with a penetrating oil, as any accumulation of dirt on the drive might restrict the free movement of the pinion. Never clean the armature and field coils in a degreasing tank, or with grease dissolving materials since these may damage the insulation. The commutator should be trued in a lathe and the mica undercut if necessary. Replace all parts showing excessive wear. All wiring and connections should be checked. Rosin flux should be used in making soldered connections. Acid flux must never be used on electrical connections. Submit reassembled unit to NO LOAD and LOCK TORQUE TESTS.

Checking of Improperly Operating Starting Motor

If the starting motor does not develop rated torque and cranks

the engine slowly or not at all, check the battery, battery terminals and connections and the battery cables. Corroded, frayed or broken cables should be replaced and loose or dirty connections corrected. The starting motor control switch should be checked for burning contacts and the switch contacts cleaned or the switch replaced if necessary. If all these are in order, remove the cover bank of the starting motor and inspect the brushes and commutator. The brushes should form good contact with the correct brush spring tension. A dirty commutator can be cleaned with a strip of No. 00 sandpaper held against the commutator with a stick while the starting motor operates. NEVER USE EMERY CLOTH TO CLEAN COMMUTATOR. If the commutator is very dirty, or burned, or has high mica, remove the armature from the starting motor and take a cut off the commutator in a lathe. The mica should be undercut to a depth of 1/32-inch.

If there are burned bars on the commutator, it may indicate open circuited armature coils which will prevent proper cranking. Inspect the soldered connections at the commutator riser bars. An open armature will show excessive arcing at the commutator bar which is open, on the no-load test.

Tight or dirty bearings will reduce armature speed or prevent the armature from turning. A worn bearing, bent shaft, or loose field pole screws will allow the armature to drag on the pole shoes, causing slow speed or failure of the armature to revolve. Check for these conditions.

If the brushes, brush spring tension and commutator appear in good condition, the battery and

REPAIR SECTION

ELECTRICAL SYSTEM - Continued

Checking of Improperly Operating Starting Motor - Continued

external circuit found satisfactory, and the starting motor still does not operate correctly, it will be necessary to remove the starting motor for no-load and torque checks.

No-Load Test

Connect the starting motor in series with a battery of the specified voltage and an ammeter capable of reading several hundred amperes. If an R.P.M. indicator is available, read the armature R.P.M. in addition to the current draw.

Torque Test

It is advisable to use in the circuit a high current carrying variable resistance, so that the specified voltage at the motor can be obtained. A small variation of the voltage will produce a marked difference in the torque developed.

Interpreting results of NO-LOAD AND TORQUE TESTS

1. Rated torque, current draw and no-load speed indicates normal condition of starting motor.
2. Low free speed and high current draw with low developed torque may result from:
 - a. Tight, dirty, or worn bearings, bent armature shaft or loose field pole screws which would allow the armature to drag.
 - b. Shorted armature. Check armature further on growler.
 - c. A grounded armature or field. Check by raising the grounded brushes and insulating them from the commutator with cardboard and then checking with a test lamp between the insulated terminal and the frame. If test lamp lights, raise other brushes from
- commutator and check fields and commutator separately to determine whether it is the fields or armature that is grounded.
3. Failure to operate with high current draw:
 - a. A direct ground in the switch, terminal or fields.
 - b. Frozen shaft bearings which prevent the armature from turning.
4. Failure to operate with no current draw:
 - a. Open field circuit. Inspect internal connections and trace circuit with a test lamp.
 - b. Open armature coils. Inspect the commutator for badly burned bars. Running free speed, an open armature will show excessive arcing at the commutator bar which is open.
 - c. Broken or weakened brush springs, worn brushes, high mica on the commutator, or other causes which would prevent good contact between the brushes and commutator. Any of these conditions will cause burned commutator bars.
5. Low no-load speed, with low current draw indicates:
 - a. An open field winding. Raise and insulate ungrounded brushes from commutator and check fields with test lamp.
 - b. High internal resistance due to poor connections, defective leads, dirty commutator and causes listed under 4.c. above.
6. High free speed with low developed torque and high current draw indicates shorted fields. There is no easy way to detect shorted fields, since the field resistance is already low. If shorted fields are suspected, replace the fields and check for improvement in performance.

REPAIR SECTION

MEMORANDA

REPAIR SECTION

ENGINE

Specifications

| | |
|--|---------------|
| Bore and Stroke, inches. | 4-3/4 x 6-1/2 |
| Number of Cylinders. | 6 |
| Type of Cylinders. | Wet Sleeves |
| Displacement, Cu. In. per Rev. | 691 |
| Governed R.P.M. | 1200 |
| Governed High Idle Speed, R.P.M. | 1330 |
| Governed Low Idle Speed, R.P.M. | 425 |
| Piston Speed, Feet per Minute at 1200 R.P.M. | 1300 |
| Compression Pressure, Lbs. | 465 |
| Compression Ratio. | 13.67 to 1 |
| Fuel | Diesel Fuel |

Air Cleaner

A Donaldson 10" oil-washed air cleaner with an oil cup is used on this tractor. The intake is provided with a screen to prevent large particles such as chaff, leaves, etc., from entering the air cleaner. The air passes through the screen, down the center into the oil cup, and up through screens to the intake manifold. Reversal of air flow at the base separates dust from the air. The oil carried upward with the air as a mist is separated from the air by crimped screen elements, returning the oil to the base and washing the crimped screens.

The oil cup should be removed for periodical cleaning and refilling with fresh oil to the proper level. Screens should be washed with kerosene. Joints, rubber connections, etc., should be air tight to prevent entrance of dirt particles. Refer to the "Operations Section" for complete servicing of the air cleaner.

Proper functioning of the air cleaner is important to obtain maximum power from an engine. A restricted air cleaner will cause a loss of power.

Manifold

The intake manifold is of the combination type, using a poppet-type valve to bypass air through a gasoline carburetor for starting purposes only. The function, operation, and service of the manifold assembly is covered under the "Starting System", Section 10. The manifold assembly as removed from the engine consists of the starting carburetor with primer, the air valve assembly with magneto cut-out switch, and the intake manifold.

The entire unit can be removed after disconnecting the fuel line to the carburetor; removing cotter keys and slipping out the primer control rod, choke control rod, air valve control rod, and air valve operating rod; disconnecting the magneto grounding wire inside the air valve housing; removing the nuts holding the manifold to the cylinder head; and removing the air pipe from the air cleaner to the manifold.

Replacement is the reverse of the above. Be sure gaskets are in good condition. Tighten manifold nuts to 75 ft.-lbs. torque.

When the entire unit is serviced, or parts replaced, refer to "Starting System", Section 10.

REPAIR SECTION

ENGINE - Continued

Lubrication

Capacity, U.S. Quarts 22
Full Pressure System. Yes
Oil Filter, Model N-1726
Oil Pressure, Lbs. 60
Oil Pressure
Valve In Oil Pump Body

Full force-feed lubricates the crankshaft bearings, camshaft bearings, connecting rod bearings, piston pins, valve mechanism, and timing gears.

Oil Pressure

The oil pressure is controlled by a plunger-type regulating valve located in the oil pump body set at 60 lbs. pressure. The oil regulating spring should test 47.6 lbs. at 2-3/32 inches while the free length is 3-3/32 inches.

The pressure valve O.D. is .900-inch to .901-inch, and the bore in the Purolator base is .905-inch to .906-inch, or the clearance for the valve is .004-inch to .006-inch. Be sure the valve slides freely and that the spring does not cock the valve in the bore, seating improperly.

Valve springs take a set after continued use - hence their free length may be somewhat shorter than the dimensions listed in the engine specifications. The best way to check these springs is to load them with the weight specified and measure their length at this load which is equivalent to the conditions existing when the valve spring is in the operating position. Valve springs falling below this standard should be replaced.

Oil Filters

Two N-1726 absorption-type lubricating oil filters are accessibly located on the left side of the engine. A quantity of oil is bypassed from the main circulatory system, through the cleaning element to the crankcase. Filter el-

ements should be removed every time the oil is changed, or oftener if necessary. Be sure the end of the element with the wire loop for removal is toward the top of the filter case.

Circulation

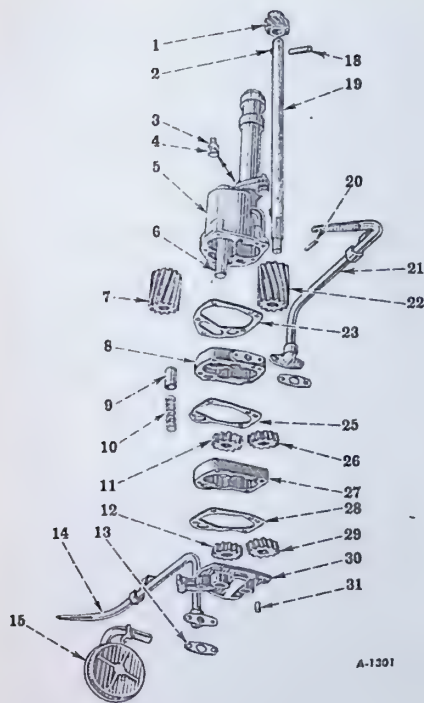
The path of lubricating oil is from the sump and through a "Float-o" oil screen from where it is pumped under pressure to the Purolator filter base. A passage leads from the base to the filters and is known as the bypass. A portion of the oil is bypassed through the filters, the amount depending upon the cleanliness of the filter elements. The filtered oil drains back into the crankcase. The pressure regulating valve in the pump body maintains the proper pressure on all bearings and at the same time protects the system and pump mechanism when thick oil caused by severe weather conditions builds up high pressure in the oil lines. The oil passed through the filters is returned to the sump as is the oil that is bypassed by the pressure relief valve. Oil is distributed into rifle-drilled passages in the crankcase from where it is directed to the main bearings.

Oil from the main bearings passes through drilled passages in the crankshaft to the connecting rod bearings from where it is directed through the drilled passages in the connecting rods to the piston pins and cylinder walls.

Oil passages also lead to the camshaft bearings and timing gears. Other passages lead from the rear camshaft bearing and extend upward through the crankcase to the valve rocker mechanism. The valve lever shaft is hollow and distributes oil to the valve levers, valve stems, and starting mechanism. The oil is drained back to the sump through the valve push rod holes in the crankcase and in so doing it lubricates the valve tappets and cams. A valve oiler pad over the valve levers is kept saturated with oil from drilled holes in the top of the valve lever.

REPAIR SECTION

ENGINE - Continued



A-1391

Illustr. 1
Exploded View of the Oil Pump.

Oil Pump

This is a three-stage, triple-gear type of pump which operates off the worm gear at the center of the camshaft. The main set of gears supplies oil to the lubricating system; one auxiliary set of gears pumps oil from the front of the engine; the other auxiliary set pumps oil from the rear of the engine oil pan, returning the oil to the sump.

Removal of the Oil Pump

Removal of the oil pump requires taking off the crankcase guard and removing the oil pan. Then remove cap screws from the front and rear

| Ref. No. | Description |
|----------|-------------------------|
| 1 | Pinion (14 teeth). |
| 2 | Key. |
| 3 | Lock washer. |
| 4 | Cap screw. |
| 5 | Body with shaft. |
| 6 | Idler gear shaft. |
| 7 | Idler gear (12 teeth). |
| 8 | Housing, upper. |
| 9 | Regulating valve. |
| 10 | Spring. |
| 11 | Auxiliary idler gear |
| 12 | (12 teeth). |
| 13 | Gasket. |
| 14 | Oil return pipe, front. |
| 15 | Float. |
| 18 | Pin. |
| 19 | Shaft with pin. |
| 20 | Pin. |
| 21 | Oil return pipe, rear. |
| 22 | Body gear (12 teeth). |
| 23 | Housing gasket, upper. |
| 25 | Housing gasket, lower. |
| 26 | Auxiliary body gear |
| | (12 teeth). |
| 27 | Housing, lower. |
| 28 | Cover gasket. |
| 29 | Auxiliary body gear |
| | (12 teeth). |
| 30 | Cover with pin. |
| 31 | Dowel pin. |

oil return pipes (14) and (21), Illustr. 1. Gaskets (13) are attached to the pipes. Take the wire from the cap screws (4) which secure the pump to the engine and withdraw the unit from the crankcase.

Disassembly of the Oil Pump

Remove the cotter pin from the pump cover (30) and take out the oil screen or float (15). Then remove the cap screws from the cover and withdraw it. The dowel pin (31) locates the cover on the lower housing (27).

The auxiliary idler gear (12) and the auxiliary body gear (29) (square bore) can be lifted from the lower

REPAIR SECTION

ENGINE - Continued

Disassembly of the Oil Pump - Continued

housing. Gasket (28) is attached to the cover (30).

The lower housing (27) can be slid off the pump shafts (6) and (19). Gasket (25) is attached to the housing.

The second set of auxiliary gears (11) and (26) can then be removed. The upper housing (8) can be slid off the pump shafts and gasket (23) is attached to this housing. The oil pressure regulating spring (10) and the regulating valve (9) can be lifted out. Then slide the idler gear (7) off the idler gear shaft (6).

Removing pin (18) from the driving pinion (1) permits pulling the pinion from shaft (19). The key (2) locates the hole in the shaft and the hole in the pinion. Shaft (19) with the body gear (22) can now be slid out of the pump body (5). The body gear is pinned to the shaft (19) by means of the pin (20).

Service of the Oil Pump

The clearance between the pressure regulating valve (9) and the bore in the body (5) is .004-inch to .006-inch. Be sure that the valve slides freely and that the pressure regulating spring (10) does not cock the regulating valve (9) in the bore.

The backlash of the gears can be .003-inch to .006-inch. The gaskets between the body, the housing, and the cover are .006-inch thick. The shaft (19) with the pinion (1) and the body gear (22) assembled should have .003-inch to .005-inch end play when the upper housing (8) is assembled to the pump body (5).

The idler gear shaft (6) should be concentric with the body bore and should square with the bottom of the gear chamber within .001-inch. The body gear (22) and the idler

gear (7) should have .006-inch to .007-inch clearance between the body bore and the outside diameter of the gears. Use a 1/2-inch wide feeler gauge between the body and the gear; turn the pinion several revolutions when doing so. The feeler gauge should move along the bore while the gears revolve past it.

Reassembly of the Oil Pump

With the key (2) in lower end of shaft (19), press on the gear (22). Drive the pin (20) into the shaft. Press the idler gear shaft (6) into the pump body (5) so the lower end is 3-5/32-inches from the bottom surface of the body. Slide shaft (19) and gear (22) in the body (5), press gear (1) on the end of the shaft, and drive the pin (18) into the shaft and gear. Be sure pins driven in gears are flush with the bottom of the teeth and will not interfere with the teeth of the meshing gear. Slide the auxiliary idler gear (12) on its shaft (6), attach the housing gasket (23) to the pump body with a light coat of grease and put the upper housing (8) in place. With the housing held tight against the body, there should be .003-inch to .005-inch end play. Add another gasket if necessary to get this clearance. Remove the upper housing, place the regulating valve (9) in place with its spring (10), and reattach the upper housing (8), using the 3/8-inch cap screw.

Slip the auxiliary gears (11) and (26) on their respective shafts, attach the gasket (25), and hold the lower housing (27) in position to observe the end clearance of the auxiliary gears. Use additional shims (25) if necessary. Follow the same procedure for the auxiliary gears (12) and (29) when attaching the cover (30) with its gasket (28). Dowel pins locate these parts one on the other. Attach the "Float-o" oil screen to the cover (30) and insert the cotter key. The end of the pipe on the screen may be rebabbitted and

REPAIR SECTION

ENGINE - Continued

Reassembly of the Oil Pump - Continued from Page 4

refitted to the cover. The pump is ready for replacement on the engine after lubricating the gear (1) and shaft (19).

Replacement of the Oil Pump

Push the oil pump into place in the crankcase and attach with the two cap screws (4). Rewire the heads of the bolts. Attach the front and rear oil return pipes (14) and (21) to the crankcase and the cover (30) and upper housing (8), using the gasket (13). Reattach the oil pan (16) with the gasket (32) in place.

Cylinder Head

The cylinder head is made up of two sections, with the water passages connected by a water manifold. Each head can be removed independent of the other. The cylinder head gasket is assembled to the block with the three elongated holes toward the injection pump side. The gaskets used for both the front and rear cylinder heads are identical. The gasket is reversible. Copper gasket rings located on top of the sleeves assure a gas-tight seal between the head and the sleeve. The flange side of the copper rings should always be on top.

Removal of the Cylinder Heads

Remove the valve housing cover (13), *Illust. 3*, and the valve rocker lubricating felt (16). Then unhook the cross shaft spring and take out the cotter keys and pins in the two control rods "DD" and "G", *Illust. 1*, Section 10. The valve lever assembly can be removed by taking out the nuts progressively around the outer edge, then the cap screws and nuts on the brackets, and finally the five larger nuts from the long studs in the cylinder heads. Keep the assembly level when lifting it off as a

unit. (*See Illust. 2*) Then remove the valve push rods (62), *Illust. 3*.



Illust. 2
Lifting off the
Valve Lever Assembly.

Disconnect the tubing from the fuel injection pump and the nozzles, and place caps on the injection pump to protect it from dirt. If new cylinder heads are being installed, the nozzles and retainers must be removed. They come out as complete assemblies and the spacers and gaskets are lifted out separately.

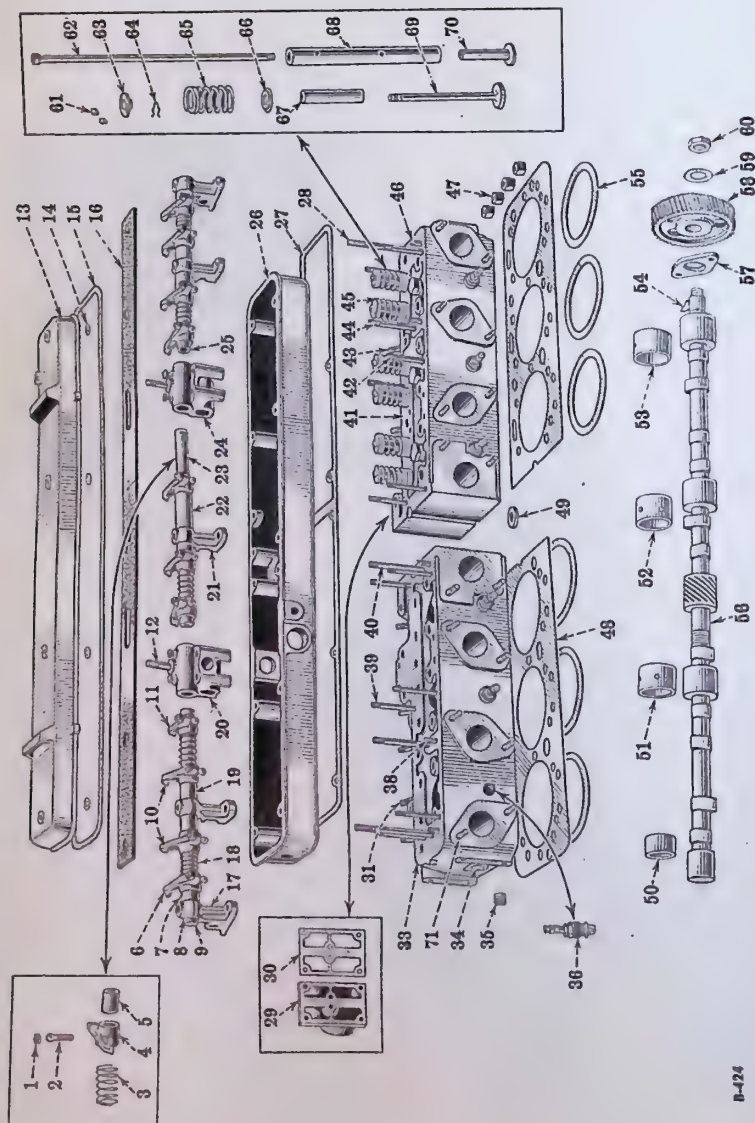
The water manifold (29), *Illust. 3*, which connects the front and rear cylinder heads then comes off with its gasket (30). The pipe from the air cleaner to the manifold can be lifted off after the clamp is loosened and the cap screws on the manifold have been taken out.

Disconnect the carburetor choke control, the fuel shut-off control rod, and the primer control. Then close the valve on the gasoline tank and disconnect the line from the carburetor. Take off the plate with the gasket from the housing
(Continued on page 8.)

REPAIR SECTION

ENGINE - Continued

Cylinder Head, Valves, Etc.



Illustr. 3
Exploded View of the Cylinder Head, Valves and Camshaft.

REPAIR SECTION

ENGINE - Continued

Cylinder Head, Valves, Etc. - Continued

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|---------------------------------------|----------|--|----------|-----------------------------|
| 1 | Nut. | 25 | Shaft (front and rear). | 44 | Bracket stud, intermediate. |
| 2 | Adjusting screw. | 26 | Housing. | 45 | See detailed illustration. |
| 3 | Valve lever spring. | 27 | Housing gasket. | 46 | Valve lever bracket stud. |
| 4 | Valve lever with bushing, right hand. | 28 | End bracket stud. | 47 | Stud nut. |
| 5 | Bushing. | 29 | Water manifold. | 48 | Gasket, front and rear. |
| 6 | Valve lever with bushing, left hand. | 30 | Gasket. | 49 | Center stud washer. |
| 7 | Spacer, outer. | 31 | Nozzle body stud. | 50 | Bearing, rear. |
| 8 | Retainer ring. | 33 | less valves. | 51 | Bearing, No. 3. |
| 9 | Shaft plug. | 34 | Cylinder head, rear, | 52 | Bearing, No. 2. |
| 10 | Valve lever with bushing, straight. | 35 | with valves. | 53 | Bearing, front. |
| 11 | Valve lever with bushing, right hand. | 36 | Expansion plug, 1-1/8". | 54 | Key. |
| 12 | Front center bracket stud. | 38 | Plug, 1/2". | 55 | Gasket ring. |
| 13 | Cover. | 39 | Spark plug (Champion No. 44) (optional). | 56 | Camshaft. |
| 14 | Washer. | 40 | Spark plug (AC No. 18) (optional). | 57 | Plate. |
| 15 | Gasket. | 41 | Valve lever bracket stud (short). | 58 | Gear. |
| 16 | Felt. | 42 | Valve housing stud. | 59 | Nut lock. |
| 17 | End bracket. | 43 | Hex. nut, 3/8" N.F. | 60 | Nut. |
| 18 | Valve lever spring. | 44 | Bracket stud, intermediate. | 61 | Valve spring collar key. |
| 19 | Spacer, intermediate. | 45 | Cylinder head, front, with valves. | 62 | Push rod. |
| 20 | Cross shaft bracket with stud. | 46 | Cylinder head, front, less valves. | 63 | Upper seat. |
| 21 | Bracket, intermediate. | 47 | Valve lever bracket stud. | 64 | Retainer. |
| 22 | Spacer, center. | 48 | Nozzle body stud. | 65 | Valve spring. |
| 23 | Shaft, center: | 49 | | 66 | Lower seat. |
| 24 | Front center bracket with stud. | 50 | | 67 | Valve guide. |
| | | 51 | | 68 | Guide. |
| | | 52 | | 69 | Exhaust valve. |
| | | 53 | | 70 | Intake valve. |
| | | 54 | | 71 | Valve tappet. |
| | | 55 | | | Manifold gasket. |

REPAIR SECTION

ENGINE - Continued

Removal of the Cylinder Heads - Continued

above the carburetor, disconnect the wires from the terminals in the housing, and then pull them out.

Remove the intake manifold assembly and the gaskets and also the exhaust manifolds and their gaskets. Spark plugs can be taken out but it is not necessary to do this unless new cylinder heads are being installed.

Remove three cap screws from the thermostat housing to take it off.

Before taking off the rear cylinder head, two bolts must be removed from the dash. Remove the stud nuts and lift off the cylinder head assemblies. Removal of the gaskets (48) and the copper rings (55) clears the top of the block.

Disassembly of the Cylinder Heads

Place the cylinder heads on a bench with a small block to support the valves when the springs are depressed. Be sure to keep the valves in order and replace them in their original positions.

To remove the valves, depress the upper seat and remove the keys. Lift off the upper seat and the spring and remove the retainer and lower seat. Tip the head on its side and withdraw the valves.

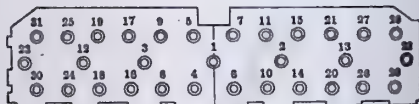
To remove the starting valves, take the cotter key from the retainer and unscrew it. The valves can then be removed from the head. Be sure to keep the valves in proper order.

Replacement of the Cylinder Heads

Valve guides (66), *Illust. 3*, in the heads are replaceable. They are assembled with the chamfered end to the top. The top of the starting valve guide (18), *Illust. 4*, is 15/16-inch below the upper

surface of the head. The exhaust and intake valves (69), *Illust. 3*, are 1-3/8-inch above the surface. Be sure to clean the lower surface of the cylinder heads and also the top of the block before putting the heads on the crankcase. Put new gaskets in position with the numbered side up. Be sure to place the copper rings on top of the cylinder sleeves with the flanged side up.

Check the heads for alignment with a straight edge across the manifold side. The center stud nut has a washer (49), which contacts both heads. Run all the stud nuts down with a speed wrench. Starting at the center nut, follow the pattern indicated on the Nut Tightening Sequence Chart, *Illust. 4*, and snug up each nut. After easily and uniformly drawing down all nuts in gradual steps, go over them again with a torque wrench, and then again, by gradual steps, draw them all down to 170 ft.-lbs. torque. Torque wrench SE-1137 (0-100 ft.-lbs.) and extension bar SE-1137-1 (60-175 ft.-lbs.) are available.



A-1218

Illust. 4
Cylinder Head Nut Tightening
Sequence Chart.

Replace the valve push rods (62), *Illust. 3*, and be sure they are in the tappet sockets. When the rear cylinder head has been removed, be sure to replace the two cap screws on the dash.

Put a new gasket between the housing and cylinder heads, lower the valve assembly onto the heads, and then loosen all of the valve lever screws before tightening the housing nuts. Start the cap screws and nuts on the brackets, then start the five large nuts on the studs,

REPAIR SECTION

ENGINE - Continued

Replacement of the Cylinder Heads - Continued

and finally the nuts around the outer edge. Tighten the cap screws and nuts evenly in the order of their replacement.

Assemble the gasket (30) and water manifold (29) which connects the water jackets with the front and rear cylinder heads. Replace the nozzles and retainer assemblies in the heads after inserting the nozzle gaskets and spacers. Be sure that the word "up" on the spacers faces towards the valve housing. Then connect the tubing between the injection pump and the nozzles. Fasten the thermostat housing, being sure to put a new gasket in place.

The exhaust manifold gaskets are shaped to go on only one way. When they are in place, the manifolds can be secured to the cylinder heads. Then replace the spark plugs, connect the wires, and lift the intake manifold assembly into position and tighten it. Connect the primer and carburetor choke controls, the fuel shut-off control rod, the gasoline line, and the wires of the intake manifold.

Refer to the "Starting System", Section 10, to adjust the controls and starting valve clearance.

Then connect the pipe from the air cleaner to the manifold. Readjust the valves as described in the "Operations Section".

Valves

Specifications

Valve Seat Width. 3/32 in.

Valve Seat Angle. 45°

Stem Guides
(Replaceable) Grey Iron

Stem Diameter

Intake Valves432 in.-
.433 in.

Exhaust Valves.431 in.-
.432 in.

Stem Clearance in Guide

Intake Valves002 in.-
.004 in.

Exhaust Valves.003 in.-
.005 in.

Tappet Clearance, Hot. . .018 in.

Valve Spring, Free
Length2-7/8 in.

Valve Spring Test. . . .50-56 lbs.
at 2-1/2 in.

Valve Lever Shaft,
Diameter9660 in.-
.9665 in.

Valve Lever Clearance
in Bushing0015 in.-
.002 in.

Valve Lever Bushing,
Length 1.250 in.

Intake Valves

Material MD-3140

Head Diameter. 2 in.

Port Diameter. 1.780 in.

Lift 1/2 in.

Valve Opens. 10° before TC

Valve Closes 25° after LC

Exhaust Valves

Material Sil. No. 2

Head Diameter. 1-5/4 in.

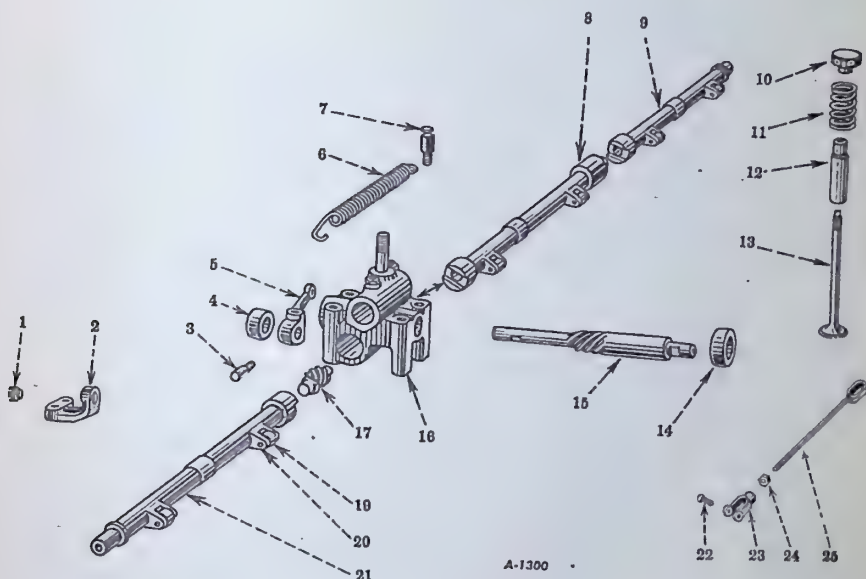
Port Diameter. 1.530 in.

When replacing the valve levers on the shaft, be sure the spacers are in the correct place and that the right, left, and straight levers are in the proper place. Analyzing each group of four, the center two are straight, with a left and a right at the respective ends.

REPAIR SECTION

ENGINE - Continued

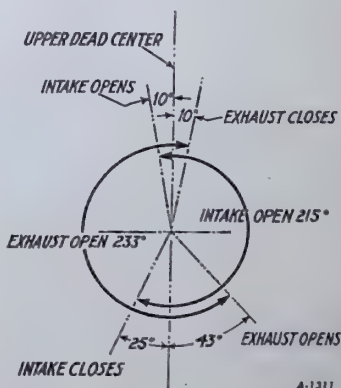
Starting Valve Mechanism



A-1300

Illustr. 5
Exploded View of the Starting Valve Mechanism.

| Ref. No. | Description |
|----------|-----------------------------|
| 1 | Cross shaft thrust screw. |
| 2 | Cross shaft thrust bracket. |
| 3 | Pin. |
| 4 | Oil seal. |
| 5 | Inner lever. |
| 6 | Cross shaft spring. |
| 7 | Spring anchor stud. |
| 8 | Shaft, center. |
| 9 | Shaft, front. |
| 10 | Spring retainer. |
| 11 | Starting valve spring. |
| 12 | Guide. |
| 13 | Starting valve. |
| 14 | Oil seal. |
| 15 | Starting valve cross shaft. |
| 16 | Bracket. |
| 17 | Gear (8 teeth). |
| 19 | Roller. |
| 20 | Pin. |
| 21 | Shaft, rear. |
| 22 | Air valve control rod pin. |
| 23 | Air valve control rod yoke. |
| 24 | Nut, 1/4 in. |
| 25 | Air valve control rod, cp. |



Illustr. 6
Engine Valve Timing Diagram.

REPAIR SECTION

ENGINE - Continued

Reassembly of the Valve Mechanism - Continued from Page 10

Reassembly of the remainder is the reverse of the removal procedure. When replacing valve springs on the cylinder heads, be sure the end of the spring, when the coils are close together, is assembled against the cylinder head.

Adjust the valve tappet clearance as described in the "Operations Section", and then readjust after the engine is hot. Connect the outer lever to the starting mechanism. Check clearance between rollers

and starting valves. If it is not .060-inch see the "Starting System", Section 10, for adjustments.

Valve Service Tools Available

SE-691-1, Intake Valve Seat Reamer
SE-904, Exhaust Valve Seat Reamer
SE-903, Valve Seat Reamer Pilot
SE-640, Valve Guide Reamer

Camshaft

| | |
|--|-----------------------|
| Bearings, Number | 4 |
| Bearing Material (Steel Back) | Babbitt |
| Bearing Journal Diameter, Front. | .2.618 in.-2.619 in. |
| Bearing Journal Diameter, 2nd. | 2.4305 in.-2.4315 in. |
| Bearing Journal Diameter, 3rd. | 2.368 in.-2.369 in. |
| Bearing Journal Diameter, Rear | 1.9305 in.-1.9315 in. |
| Running Clearance. | .0015 in.-.0035 in. |
| Bearing Length, Front. | 2-5/16 in. |
| Bearing Length, 2nd and 3rd. | .2 in. |
| Bearing Length, Rear | 1-5/16 in. |
| Thrust Plate Material. | .Grey Iron |
| End Clearance. | .005 in.-.011 in. |
| Camshaft Drive | .Helical Gear |
| Number of Teeth in Gear. | 54 |
| Pressure Lubricated. | .Yes |

The slot in the rear bearing journal allows a small amount of oil to flow from the header in the crankcase to the valve lever mechanism with each revolution of the camshaft.

Removal of the Camshaft

In the removal of the camshaft (56), *Illust. 3*, from the cylinder block, it is assumed that the engine has been removed from the

REPAIR SECTION

ENGINE - Continued

Removal of the Camshaft - Continued

tractor. The fuel injection pipes should be removed to prevent damage when the crankcase is laid on the pump side for crankshaft service.

Remove the valve lever assembly and the push rods as described under the "Cylinder Head" in this section. Remove the oil pan, the crankcase front cover, and the oil pump as described under those subjects. Remove the idler gear (29), *Illust. 9*, by bending back the corner of the bolt lock (31) and removing the cap screws through the thrust washer (30).

Turn the camshaft gear (58), *Illust. 3*, until the hole in the gear lines up with the head of the cap screw holding the thrust plate. Then remove the cap screw. Repeat the operation to remove the second cap screw. Reach up from the bottom of the crankcase and push the tappets (70) toward the top of the crankcase as far as they will go. The camshaft can now be removed from the crankcase by pulling on the gear (58). Bend the washer (59) down and remove the nut (60). Using a gear puller, remove the gear (58) from the camshaft and take off the thrust plate (57), and the key (54).

Repair of the Camshaft

Inspect the camshaft bearing journal surfaces and check to the dimensions given in the specifications. The groove in the rear bearing journal meeters oil through the valve lever-arm assembly.

In order to facilitate the replacement of the camshaft bearings (50), (51), (52), and (53), remove the flywheel and the rear engine support (4), *Illust. 9*, and drive out the plug (15) in the rear of the crankcase by using a long bar placed against the plug from the front end of the crankcase and tapping with a hammer; or by drilling a hole in the plug to pull it out.

Drive out the bearings by using a brass rod placed against the edge of the bearing and tapping. Move the end of the rod around the edge of the bearing as tapping proceeds, to prevent the bearings from jamming in the boss.

Replacement bearings are furnished reamed to size. In replacing the bearings, be sure all the holes in the bearings line up with the holes in the crankcase. The front bearing (53), *Illust. 3*, is pressed flush with the front end of the crankcase by placing a block of wood across it and tapping with a hammer. Be sure the bearing is started square with the crankcase so that it does not bind. Repeat the above procedure for the two center bearings (51) and (52), pressing them flush with the boss inside the casting. Drive the rear bearing (50) so that the inner end is 1/8-inch inside the inside end of the boss in the crankcase.

Replacement of the Camshaft

Place the thrust plate (57), *Illust. 3*, on the camshaft (56) with the countersunk surface toward the threaded end of the shaft. Insert the key (54) in the shaft and press on the gear (58) - 54 teeth. Be sure the lettered side of the gear is outside. Then put on the nut lock (59) and the nut (60).

Place the camshaft in the crankcase and tighten the two cap screws - 1/2-inch by 1-1/4-inch on the thrust plate (57). Be sure the face of the gear (58) runs true with the front plate (28), *Illust. 9*, on the engine. If this is not done, the timing gears will be noisy. Clearance between the thrust plate and the gear, when all are assembled should be .005-inch to .011-inch.

Replace the idler gear (29), *Illust. 9*. The gears are punch-marked "C", "P", and "S". Be sure all marks correspond when the idler gear is slipped on the shaft. Replace the idler thrust washer, bolt

REPAIR SECTION

ENGINE - Continued

Replacement of the Camshaft - Continued

lock (30), and tighten the cap screws. Lock the idler cap screws by bending down the corners of the bolt lock. The engine is now timed.

The magneto gear, with the bracket and magneto, can also be replaced and timed. Refer to "Timing Gears" in this section.

Replace the crankcase front cover as described under that subject, and the oil pan. Replace the plug in the rear of the crankcase with a new one. Place a good sealer on the edge of the plug and put the plug in the crankcase. Using a bar slightly smaller than the plug, set the plug by striking the bar with a hammer.

Replace the rear engine support (4), and all other parts removed.

Connecting Rods

| | |
|--------------------------------------|----------------------------|
| Length, Center to Center | 13-1/4 in. |
| Crank Pin Diameter | 3.2480 in.-3.2485 in. |
| Bearing Material | Copper Lead, Steel Back |
| Bearings, Length (Total) | 2-1/16 in. |
| Bearings, Running Clearance. | .003 in.-.004 in. |
| Rod, End Clearance | .005 in.-.012 in. |
| Bolts, Number. | 4 |
| Bolts, Material. | Alloy Steel |
| Bolts, Size. | 1/2 in. |
| Bolts, Torque, ft.-lbs. | 70 |

Connecting rods (16), *Illust. 7*, should be straight, free from twist, and parallel with the pistons. The cylinder numbers are stamped on the rod and cap - No. 1 starts at the front end of the engine. Assemble the numbered side toward the camshaft. The clearance may be checked by placing a .003-inch brass shim (1/4-inch by 1-1/4 - inch long) lengthwise between the lower bearing and the crankshaft. If the clearance is not excessive, there should be a slight drag when turning the crankshaft with the spark plugs removed.

When installing bearings (17) be sure that the bearing backs and rod surfaces are absolutely clean, smooth, and free from oil. The bearings have a nib engaging the milled notch in the rod and cap.

The connecting rods are removed from the bottom of the crankcase. The piston and rod assembly can be taken out after turning the crankshaft to the side so the piston will clear. Then pull down on the rod. Be sure the piston does not hit the shaft or crankcase. The correct position of the shaft is determined by the marks PPI, PP2, etc., on the flywheel as seen through the opening used for timing the engine. Bearing caps are held to the rods with four bolts (14) and nuts (15). A torque wrench should be used to tighten these bolts to 70 ft.-lbs. The nuts (15) have slotted heads for locking purposes. Tighten beyond 70 ft.-lbs. torque if necessary to make the holes in bolts (14) line up with slots in the nuts.

REPAIR SECTION

ENGINE - Continued

Piston Assembly

| | |
|---|----------------------|
| Piston Material | A-132 Aluminum Alloy |
| Clearance (at bottom of skirt). | .0085 in.--.0095 in. |
| "Go" Gauge (1/2" wide). | .006 in. |
| Light Pull. | 2-4 lbs. |
| "No Go" Gauge (1/2" wide) | .008 in. |
| Tight Pull. | 11-14 lbs. |

Piston Rings

| | |
|---|----------------------|
| Total Required. | 6 |
| Compression | 4 |
| Oil Control | 2 |
| Width, Compression Rings. | .123 in.--.124 in. |
| Width, Oil Control Rings. | .2485 in.--.2490 in. |
| Gap, Top Compression Rings. | .010 in.--.018 in. |
| Gap, All Other Rings. | .010 in.--.020 in. |
| Clearance in Groove, Top Compression. | .004 in.--.005 in. |
| Clearance in Groove, 2nd Compression. | .003 in.--.004 in. |
| Clearance in Groove, 3rd and 4th Compression and Oil Control (2) | .0025 in.--.0035 in. |

Piston Pin

| | |
|-----------------------------------|------------------------|
| Type. | Full-Floating |
| Retainers | Snap Rings |
| Length. | 4.105 in. |
| Diameter. | 1.6250 in.--1.6253 in. |
| Clearance in Rod Bushing. | .0003 in.--.0005 in. |
| Clearance in Piston Bore. | .0001 in.--.0003 in. |

The replaceable wet liner sleeves (22), *Illust. 7*, are select-fitted to pistons (10) to give the normal measured clearances as listed in the above specifications. The fourth compression ring (8) from the top of the piston is tapered

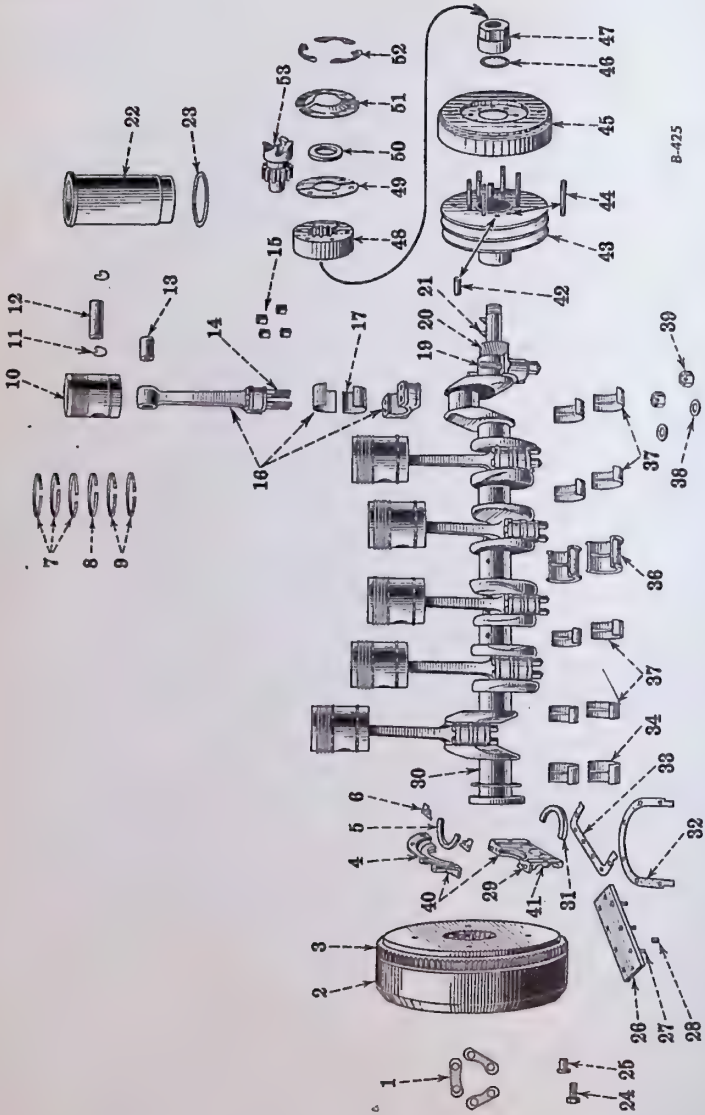
and should be assembled with the word "top" toward the top of the piston. Two oil regulating rings (9) fit in the two bottom grooves.

When replacing the rings, stagger the ring gaps around the piston.

REPAIR SECTION

ENGINE - Continued

Crankshaft, Pistons and Cylinder Sleeves



Illustr. 7
Exploded View of the Crankshaft, Connecting Rods, Pistons and Cylinder Sleeves.

REPAIR SECTION

ENGINE - Continued

Crankshaft, Pistons and Cylinder Sleeves - Continued

| Ref. No. | Description | Ref. No. | Description |
|----------|--|----------|--|
| 1 | Bolt lock. | 28 | Felt plug. |
| 2 | Flywheel with ring gear. | 29 | Dowel. |
| 3 | Flywheel ring gear. | 30 | Crankshaft with nut. |
| 4 | Crankshaft rear oil seal upper retainer. | 31 | Oil seal felt. |
| 5 | Oil seal felt. | 32 | Oil seal gasket |
| 6 | Retainer gasket. | 33 | Plate gasket. |
| 7 | Piston ring - compression (plain). | 34 | Front bearing. |
| 8 | Piston ring - compression (taper face). | 35 | Rear bearing. |
| 9 | Piston ring - oil regulating. | 36 | Center bearing. |
| 10 | Piston with pin. | 37 | Intermediate bearing. |
| 11 | Piston with pin and rings. | 38 | Washer. |
| 12 | Retainer ring. | 39 | Stud nut. |
| 13 | Piston pin (.005" oversize). | 40 | Oil seal retainer. |
| 14 | Connecting rod bushing. | 41 | Crankshaft rear oil seal lower retainer. |
| 15 | Bolt with nut. | 42 | Pin. |
| 16 | Nut. | 43 | Pulley. |
| 17 | Rod, with bushing. | 44 | Stud. |
| 18 | Rod, with bushing and bearing. | 45 | Vibration damper. |
| 19 | Rod bearing | 46 | Lock washer. |
| 20 | Stud. | 47 | Nut. |
| 21 | Gear. | 48 | Coupling. |
| 22 | Key. | 49 | Shaft retainer. |
| 23 | Sleeve with ring. | 50 | Felt washer. |
| 24 | Ring. | 51 | Felt retainer. |
| 25 | Bolt, 5/8". | 52 | Lock. |
| 26 | Dowel pin. | 53 | Starting crank adapter. |
| 27 | Plate with studs. | | |
| | Plate stud. | | |

REPAIR SECTION

ENGINE - Continued

Piston Pin - Continued

The ring grooves should be clean and free from carbon, and the oil holes in the oil control grooves should be drilled out. Fit the rings to the smallest section of the sleeve. Bathe the piston in oil before replacing it in the engine.

Piston pins (12) are the full-floating type secured in the piston bosses by retainer rings (11). Heat the piston in hot water to remove or install the pins. An oversize piston pin (.005-inch) is available marked +5 on one end or on one side. The piston bore should be reamed to give the clearances listed in the specifications.

Service Tools Available

Reamer Body. SE-949
Reamer Blades. SE-949-5
Pilot Bushing. SE-949-15
Hone Blades. SE-949-10
Burnishing Bar SE-941

Cylinder Sleeves

Wet liner type sleeves (22), *Ill-*

lust. 7, are used in this engine. They can be removed and replaced easily. They require no honing or boring after assembly. Standard piston and sleeve sets are available for service replacement. The sleeve puller SE-654 is available for removal of the sleeves. Remove the rubber sealing ring (23) from the block and clean the ring groove in the crankcase. Be sure to protect the crankshaft bearing journals with rags when cleaning out the water jackets.

Always use new sealing rings (23) and keep them free of oil and grease. Make a soap solution to which glycerine has been added (1/2 oz. of glycerine to a tablespoon of soap flakes and one quart of hot water). Apply this soap solution to the rings and place them in their grooves in the crankcase just prior to the replacement of the sleeves. Apply the same solution to the bottom of the sleeve on the outside finished surface and lower the sleeve into position. Be sure that the rubber sealing rings (23) are engaged all the way around on the taper of the sleeve. Then push the sleeve in place. Wipe out the inside of the sleeves before replacing the pistons and cylinder heads.

Crankshaft

Drilled for Pressure Lubrication. Yes
Bearing Journal Diameter. 3.4980 in. to 3.4985 in.

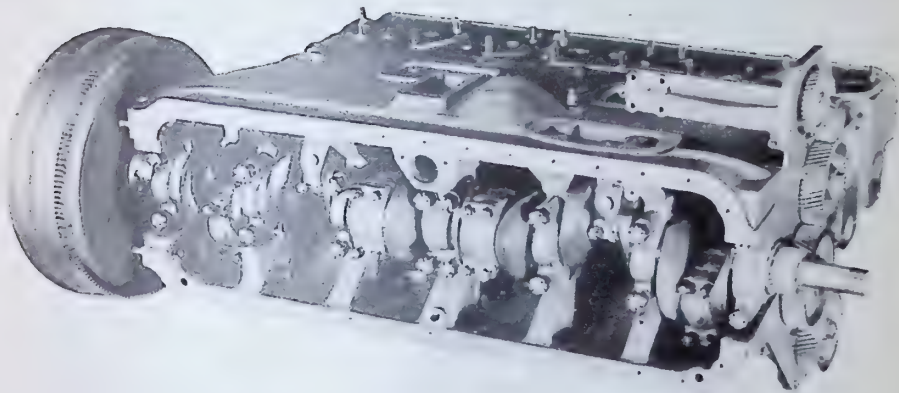
The crankshaft (30), *Illust.* 7, has Tocco-hardened bearing journals and is drilled for pressure lubrication of connecting rod bearings. Removal of the center main bearing (36) requires the removal of the oil pump. Check the end thrust of this bearing. The running clearance of the bearings can be checked by the same method as the connecting rod bearings. Each bearing cap carries a number which corresponds to a number stamped on the camshaft

side of the crankcase. The center main bearing has flange thrust surfaces. To remove the rear bearing, remove the small plate (26) below the bearing. A torque wrench should be used when pulling down the main bearing cap nuts. The amount of torque is 150 ft.-lbs.

Replacement crankshafts with bearings are available in .030-inch undersize.

REPAIR SECTION

ENGINE - Continued



Illustr. 8
Underside View of TD-18 Engine showing the
Crankshaft Assembly and Timing Gear Train.

Crankshaft - Continued

For servicing connecting rod and main bearings, with the engine in the tractor, the oil pan must be removed. However, when the engine is removed from the tractor the crankshaft is easily removed. Take off the front cover as described under that heading in this section. Remove the bolts from the flywheel (2), *Illustr. 7*, and pull the flywheel from the shaft. Then remove the oil pan. Remove plate (26) and take off the rear oil seal retainers (4) and (41), with the felts (5) and (31), and gaskets (32) and (6). Then remove the cap screws and lift off the rear engine support plate. Remove the connecting rods, the oil pump, and the main bearing caps. Lift out the crankshaft.

When replacing, be sure that the bearing caps, bearings, crank journals, and crankcase are clean and absolutely dry. Place all of the upper bearings in the crankcase, replace the shaft, and attach the bearing caps after oiling the shaft and the bearings. Be careful that

the bearings of the caps do not jump out of place when tapping the cap in place. Start with the thrust bearing and tighten all stud nuts. Check the nuts with a torque wrench at 150 ft.-lbs. Tighten the nuts further if the holes in the studs do not line up with the slots in the nuts. When all of the nuts are drawn down, the shaft can be turned over by one hand.

When replacing the flywheel, draw the bolts up to 150 ft.-lbs. torque. Be sure that the bolt locks (1) cover the dowel pins (25).

Oil Seals

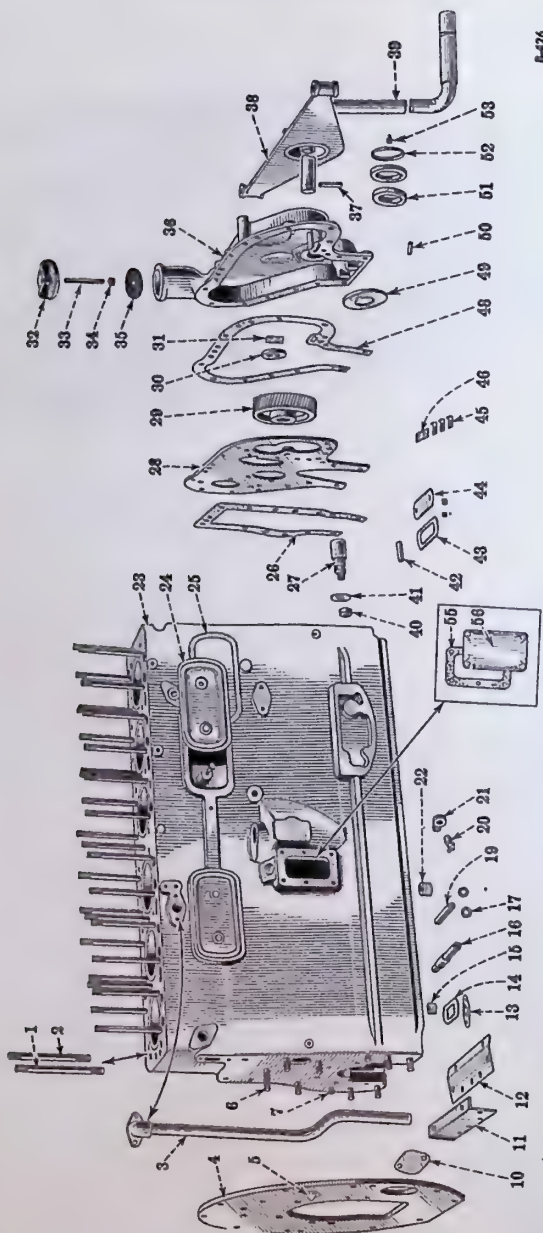
Front and rear oil seals are provided. The front seal is composed of two felt rings, located in the crankcase front cover.

The rear oil seal is the split type. The flywheel must be removed to replace this oil seal. When the oil leaks behind the flywheel, check the fit of the Welch plug at the rear of the camshaft, replace the felt, and check the rear main bearing for excessive wear.

REPAIR SECTION

ENGINE - Continued

Crankcase



B-476

Illust. 9
Exploded View of the Crankcase.

REPAIR SECTION

ENGINE - Continued

Crankcase - Continued

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|-------------|----------------------------|-------------|--|-------------|-----------------------------|
| 1 | Cylinder head stud, long. | 22 | Plug, 1". | 37 | Starting crank ratchet pin. |
| 2 | Cylinder head stud, short. | 23 | Crankcase with plugs, studs and camshaft bearings and cap. | 38 | Front engine support. |
| 3 | Breather pipe. | 24 | Side plate. | 39 | Starting crank. |
| 4 | Rear engine support. | 25 | Gasket. | 40 | Nut, 3/4" N.F. |
| 5 | Timing indicator. | 26 | Front plate gasket. | 41 | Nut lock. |
| 6 | Rear engine support stud. | 27 | Idle gear shaft with pin. | 42 | Dowel. |
| 7 | Dowel pin. | 28 | Front plate. | 43 | Gasket. |
| 10 | Timing mark cover. | 29 | Idle gear with bushing. | 44 | Plate. |
| 11 | Dust seal. | 30 | Thrust washer. | 45 | Screw lock. |
| 12 | Dust seal gasket. | 31 | Cap screw lock. | 46 | Screw strip. |
| 13 | Gasket. | 32 | Oil filler cap. | 48 | Front plate gasket. |
| 14 | Gasket. | 33 | Stud. | 49 | Oil flinger. |
| 15 | Plug, 3/4". | 34 | Hex. nut, 3/8" N.C. | 50 | Oil pan stud. |
| 16 | Oil level gauge sleeve. | 35 | Strainer. | 51 | Felt. |
| 17 | Washer. | 36 | Front cover, complete. | 52 | Retainer. |
| 19 | Oil filter return pipe. | | | 53 | Lubricator. |
| 20 | Drain cock. | | | 55 | Side cover gasket. |
| 21 | Drain cock elbow, 3/8". | | | 56 | Side cover. |

REPAIR SECTION

ENGINE - Continued

Main Bearings (Steel Back Precision)

| | |
|---|------------------------|
| Number. | 7 |
| Material. | Copper Lead |
| Total Length, Front | 1-7/8 in. |
| Total Length, Intermediate (2, 3, 5, 6) | 1-5/8 in. |
| Total Length, Center Thrust | 3.118 in. to 3.120 in. |
| Total Length, Rear. | .2-1/16 in. |
| Running Clearance | .003 in. to .004 in. |
| End Clearance | .008 in. to .012 in. |

When bearing clearance is excessive, replacement is necessary. The clearance may be checked with a pressure tank connected to the lubricating system, or by placing a .003-inch brass shim (1/4-inch by 1-1/4-inch long) lengthwise between the lower bearing and the crankshaft. The rate of the oil flow in the first method, and the drag on the crankshaft in the second method, indicates the amount of clearance.

Check the end play by driving a wooden wedge between the crankshaft and the rear of the crankcase, forcing the shaft to the front with the front crankshaft thrust surface tight against the front thrust flange of the center bearing. Remove the wedge and measure the thrust flange clearance on the upper and lower bearing flanges.

Each bearing can be replaced without removing the crankshaft. The oil pump must be removed when replacing the center main bearing. Tap the bearing cap lightly with the hammer to loosen and remove the cap from the studs. The lower bearing can then be removed from the cap. The upper bearing can be slid out of place by pushing on the end without the nib, using a thin piece of flexible metal while turning the crankshaft over with the hand crank in the direction of removal. The center main bearing has

flanged thrust surfaces. To take out the rear bearing, remove the small plate (26), *Illust. 7*, below the bearing. The cap and bore of the bearings are milled to receive the projection on the back of the bearing liner. The projection end is removed first.

When replacing, rotate the shaft so that the projection enters last. The bearing backs, crankcase bore, and cap bore should be absolutely clean and dry when replacing the shells. Put the bearing cap in place with the numbered side facing the numbered side or camshaft side of the crankcase. The main bearing numbers are stamped on the surface to which the oil pan attaches. The ends of the caps fit snugly into the crankcase. Engage one end first and tap the cap into place.

Crankcase Front Cover

When the engine is removed from the tractor, the crankcase front cover (36), *Illust. 9*, can be taken off. After taking out the crank pin (37) in the crankshaft, remove the nut and nut lock from the crankshaft, remove the fan belts, pull the fan drive pulley, remove the two keys from the crankshaft, and then the bolts from around the front cover.

REPAIR SECTION

ENGINE - Continued

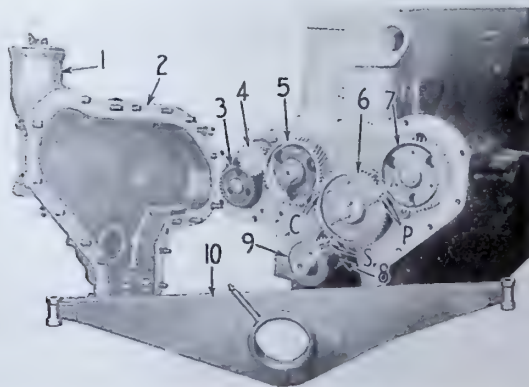
Crankcase Front Cover - Continued

The crankshaft front oil seals (51) are located in the front cover. The cover is doweled to the front plate (28), of the engine. The front crankcase support (38) does not have to be removed before taking off the cover.

Timing Gears

The timing gear train is accessible

when the crankcase front cover is off. The timing gears are driven off the front end of the crankshaft and provide a positive and accurate drive to the camshaft, injection pump, and magneto. These gears must be in their proper place to have the engine timed correctly. The gears are punch-marked and stamped "C", "P", and "S" for proper timing. Replace the idler gear last. Have the other gears arranged to make the letters correspond as shown in *Illust. 10*.



Illust. 10
Timing Gears.

1. Front Cover; 2. Gasket; 3. Magneto Drive Gear; 4. Magneto Idler Gear; 5. Camshaft Gear; 6. Idler Gear; 7. Injection Pump Drive Gear; 8. Crankshaft Gear; 9. Crankshaft Oil Flinger; 10. Front Engine Support.

Idler Gear

The idler gear (29), *Illust. 9*, is held to the crankcase with a thrust washer (30), using two cap screws with lock (31). The idler gear slides off the idler gear shaft (27) which is held to the crankcase with a nut (40) and lock (41) fastening on the inside of the case. A pin in the idler shaft locates

the hole in the shaft with respect to the hole in the crankcase so that the bushing in the idler gear receives pressure lubrication.

Camshaft Removal

The camshaft removal is covered under the "Camshaft" in this section.

REPAIR SECTION

ENGINE - Continued

Injection Pump Drive

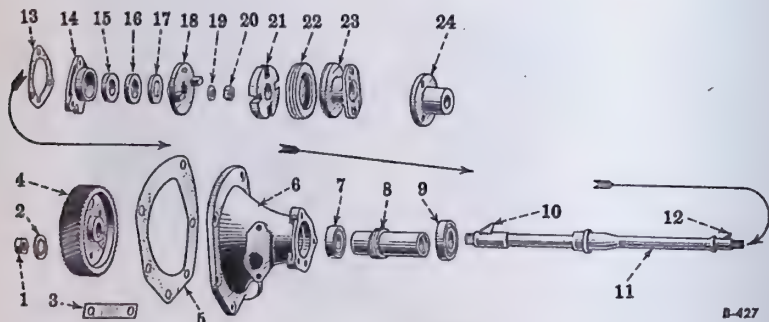
The injection pump drive gear assembly can be removed after taking off nut (1), *Illustr. 11*, nut lock (3), and pulling the gear (4). This gear has tapped holes for a puller adapter.

With the injection pump removed, the remainder of the assembly can be lifted from the front plate after taking out the bolts in housing (6).

The shaft (11) can be removed from the housing after the cap screws from cap (14) are taken out. The

cap will come out with the shaft. When the nut and washer are removed, the flange (18) can be pulled off the shaft (11).

The felt retainer (17), felt (16), and oil seal (15) can be removed from the cap (14). Be sure to use a new retainer, felt, and seal when replacing. Bearings (7) and (9), and the hour meter drive gear (8) can be removed from the housing (6). When replacing, put the bearing (9) in place first. Then the hour meter drive gear (8), and the bearing (7) go in the housing (6) from the front end.



B-427

Illustr. 11
Exploded View of the Injection Pump Drive.

| Ref. No. | Description | Ref. No. | Description |
|----------|------------------------|----------|------------------|
| 1 | Nut, 3/4". | 14 | Cap, complete. |
| 2 | Nut lock. | 15 | Oil seal. |
| 3 | Lock. | 16 | Felt. |
| 4 | Gear (54 teeth). | 17 | Felt retainer. |
| 5 | Housing gasket. | 18 | Flange with pin. |
| 6 | Housing with plug. | 19 | Dowel pin. |
| 7 | Bearing. | 20 | Washer. |
| 8 | Hour meter drive gear. | 21 | Nut, 1/2" N.F. |
| 9 | Bearing. | 22 | Spacer. |
| 10 | Key (Woodruff #15). | 23 | Boot. |
| 11 | Shaft. | 24 | Adjuster. |
| 12 | Key (Woodruff #9). | | Drive flange. |
| 13 | Gasket. | | |

REPAIR SECTION

ENGINE - Continued

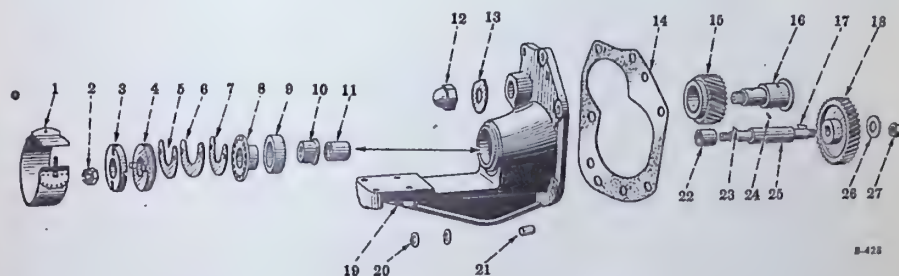
Magneto Drive

The magneto drive, *Illust. 12*, is driven from the camshaft gear. Dowel pins (21) in the bracket (19), locate the unit on the crankcase front plate. The magneto idler gear (15) can be removed after bending back the lock washer (13) and turning out nut (12). Push the shaft (16) out of the bracket (19) and lift off the idler gear. The pipe plug can be removed from the shaft (16) to clean the inside. The pin (24) holds the shaft in position so that the pressure lubricating oil holes line up.

The magneto drive shaft (25) can be removed from the bracket after removing the nut (27) and the lock washer (26) from the end of the

shaft and pulling gear (18) from the shaft. Remove key (17) from the shaft and slide the shaft out. With the shaft out of the bracket, the oil seal (9) can be removed for replacement.

The diameter of the drive shaft (25) is .8720-inch to .8725-inch and the finished diameter of the bushings (22) and (11) is .874-inch to .875-inch. Two bushings are used. Replacement bushings must be pressed into place, flush with each end of the bracket, and then reamed to the sizes above. The bushing for the magneto idler gear (15) is not available separately; the inside diameter is 1.500-inch to 1.501-inch, and the shaft diameter for the idler gear is 1.4990 inch to 1.4995-inch.



Illust. 12
Exploded View of the Magneto Bracket and Drive.

| Ref. No. | Description | Ref. No. | Description |
|----------|----------------|----------|---|
| 1 | Cover. | 15 | Gear, complete. |
| 2 | Nut, 1/2" N.F. | 16 | Shaft, complete. |
| 3 | Spacer. | 17 | Key. |
| 4 | Block (male). | 18 | Gear. |
| 5 | Shim (medium). | 19 | Bracket with dowels, bushings and pipe plugs. |
| 6 | Shim (heavy). | 20 | Gasket. |
| 7 | Shim (light). | 21 | Dowel. |
| 8 | Coupling. | 22 | Bushing. |
| 9 | Oil seal. | 23 | Key. |
| 10 | Spacer. | 24 | Pin. |
| 11 | Bushing. | 25 | Shaft. |
| 12 | Nut. | 26 | Washer. |
| 13 | Washer. | 27 | Nut, 1/2" N.F. |
| 14 | Gasket. | | |

REPAIR SECTION

MEMORANDA

REPAIR SECTION

ENGINE CLUTCH

| | |
|-----------------------------------|------------------------------|
| Size. | 17 inch |
| Manufacturer. | Rockford |
| Type. | Single plate, over-center |
| Torque capacity, ft.-lbs. | 1488 |
| Throwout bearing, type. | Ball |
| Pilot bearing, type | Ball |

The hand-operated, over-center clutch with ball-bearing release has two rollers in each release cam to prevent wear and binding.

The release mechanism has a clutch brake which facilitates faster shifting of the transmission gears. No adjustment of this brake is necessary.

Pins on the release carrier (9), *Illust. 1*, have bushings (3) and (11) which fit into the release fork (10), reducing wear and friction to a minimum at this point. When replacing a release fork, be sure to engage the bushings in the fork and have the ridged end of the bushings on the inside.

The clutch can be removed through the top of the main frame without disturbing the engine or transmission. It is necessary to remove the clutch when the transmission has to be removed.

Removal of the Engine Clutch

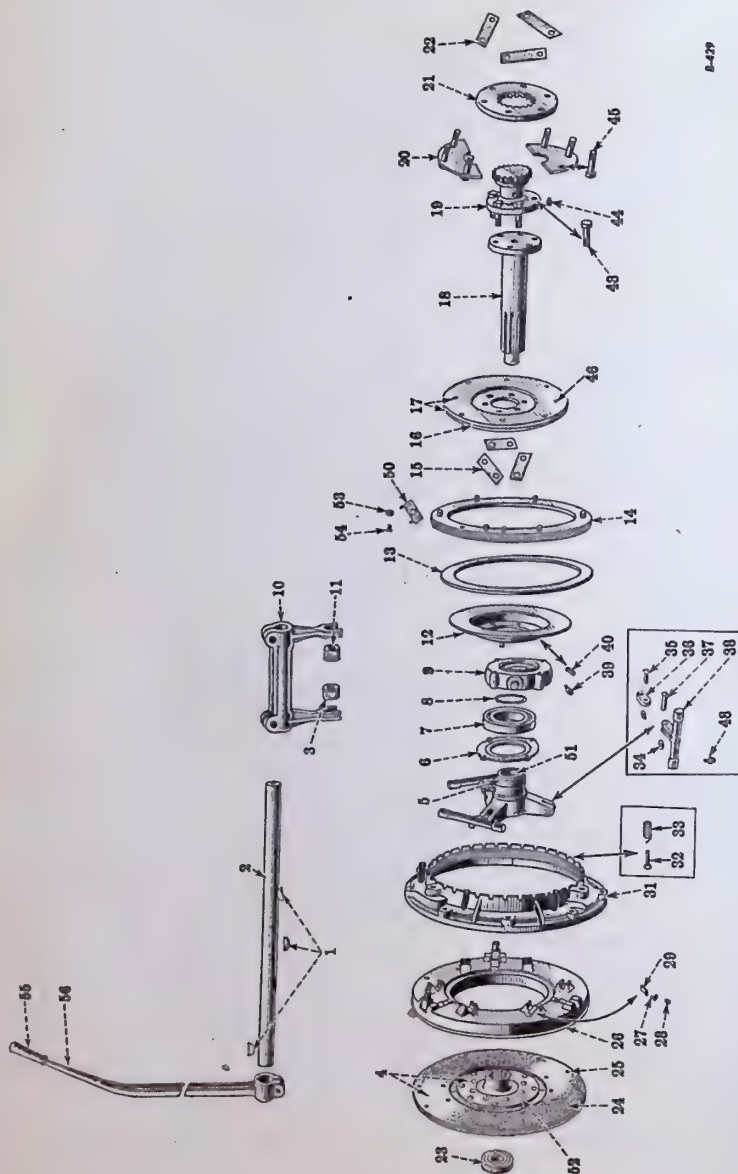
Before removing the engine clutch, take off the bottom of the air cleaner, lock the steering brake pedals forward, and tie back the steering clutch levers for additional clearance. Take out the capscrews around the edge of the clutch cover and the two capscrews on each side under the fenders.

Engage the clutch and remove nuts from the coupling bolt (43), *Illust. 1*, on the clutch side of the brake friction disc (17). Turn the engine over with the hand crank to make all nuts accessible. Remove nuts and bolts (45) from the rear of the clutch coupling ring (21). These nuts are all made accessible by turning the coupling with the clutch disengaged and transmission in neutral. When the bolts are all removed from the front end of the coupling it can be lifted out.

Loosen one bolt in the hand lever and two in the release fork (10). Put a bar through the holes in the fender side sheet and drive the hand lever off the release shaft (2). Remove the key with a small punch. Drive the shaft out of the release fork until the keys (1) are accessible for removal. Then drive the shaft clear through the main frame and remove it. The release fork (10) can then be removed from the carrier (9). Bushings (3) and (11) can also be taken out. Remove the capscrews from the back plate (31). Then, with the help of a pinch bar, pry out the clutch shaft (18) sufficiently to clear the pilot bearing (23). The entire clutch unit can then be lifted out. The pilot bearing can be pulled out with a puller, SE-672.

REPAIR SECTION

ENGINE CLUTCH - Continued



Illustr. 1

Exploded View of the Engine Clutch.

REPAIR SECTION

ENGINE CLUTCH - Continued

| Ref. No. | Description | Ref. No. | Description |
|--------------|-------------------------------------|----------|------------------------------------|
| 1 | Key (Woodruff No. 18). | 25 | Rivet. |
| 2 | Shaft. | 26 | Plate assembly. |
| 3 | Pin bushing. | 27 | Cam block screw lock. |
| 4 | Driven member assembly. | 28 | Screw, 1/4" - 20 x 1 1/2". |
| 5 | Sleeve and bushing. | 29 | Cam block (set of six). |
| 5,6,7,8,9,12 | Sleeve and bearing assembly. | 31 | Back plate. |
| 6 | | 32 | Bolt. |
| 7 | Plate. | 33 | Spring. |
| 8 | Release bearing. | 34 | Washer, 3/8" I.D. x 7/8" O.D. |
| 9 | Ring. | 35 | Link pin, long. |
| 10 | Carrier. | 36 | Link. |
| 11 | Fork. | 37 | Link pin, short. |
| 12 | Pin bushing. | 38 | Camshaft (set of three) 86 blocks. |
| 13 | Disc. | 39 | Lubricator fitting. |
| 14 | Ring plate. | 40 | Dowel pin. |
| 15 | Adjusting ring. | 43 | Coupling bolt. |
| 16 | Bolt lock. | 44 | Pilot lubricator. |
| 17 | Facing. | 45 | Ring bolt. |
| 18 | Disc with facing, ep. | 46 | Brake disc facing rivet. |
| 19 | Clutch shaft. | 48 | Camshaft lubricator. |
| 20 | Coupling (18 teeth). | 50 | Adjusting lock. |
| 21 | Coupling washer. | 51 | Sleeve bushing. |
| 22 | Ring (18 teeth). | 52 | Flat head rivet, 3/8 x 3/4". |
| 23 | Bolt lock. | 53 | Adjusting lock screw nut. |
| 24 | Bearing (pilot). | 54 | Adjusting lock screw. |
| | Facing package (two woven facings). | | |

REPAIR SECTION

ENGINE CLUTCH - Continued

Disassembly and Repair of the Engine Clutch

Slide the driven member assembly (4) from the clutch shaft (18). If the facing (24) shows considerable wear, is rough, or oil soaked it should be replaced, providing, however, that the driven member plate (4) is in good condition. When installing new facing, be sure all rivets (25) are well countersunk. If the pressure plate assembly (26) is heat checked, scored, or warped, replace it with an entire new unit.

Remove the clutch shaft (18) and the disc (17). Then take off the adjusting ring lock (50). Unscrew the adjusting ring (14) and release the ring plate (13). Unscrew the bolts (32) and springs (33) to disengage the back plate (31) from the pressure plate assembly (26). If the pressure plate shows discoloration due to heat, it should be replaced.

Remove the cotter key, washers (34), the long link pin (35), the link (36), the short link pin (37), and the camshaft (38). If any of these show considerable wear they should be replaced.

Remove the capscrew in the disc (12) so the disc can be tapped off the carrier (9). Then remove the capscrews from plate (6) and pull the carrier (9) from the sleeve (5). Remove the snap ring (8) from the sleeve.

Pull the release bearing (7) and the plate (6) from the sleeve. The bushings (51) in the sleeve are replaceable; they are furnished to size and can be pressed into place. The shaft diameter is 1.997 inch to 1.999 inch. The running clearance between the shaft and bushing is .001 inch to .005 inch. Replace the bushings if the clearance is excessive. The ends of the bushings are flush with the ends of the sleeve.

Reassembly of the Engine Clutch

Clean out all grease fittings in the drilled shaft before reassembling the clutch.

With the plate (6) assembled to the sleeve (5), press the bearing (7) onto the sleeve. Then replace the snap ring (8) on the sleeve. Drive the carrier (9) over the bearing (7). Replace the capscrews in plate (6) and carrier (9). Insert dowel pins (40) in the carrier and secure plate (12) to the carrier with the capscrews. Replace the link and pin assembly (34), (35), (36), and (37) between the camshaft (38) and the sleeve (5). Be sure the drilled oil hole in the camshaft is open.

Drop the camshaft (38) into the plate assembly (26) with the cam stops facing the back plate (31). With the ring plate (13) in position, and the adjusting ring (14) started, bring up the back plate (31) to the plate assembly (26).

Insert bolts (32), replace the springs (33), and the nuts and cotter keys. The nuts should be run down the same distance on each bolt. To facilitate final adjustment of the clutch, screw in the adjusting ring (14) until the distance from the face of the plate (26) to the face of the back plate (31) is 31/32".

Assemble the disc (17) to the clutch shaft (18) and replace the shaft in the assembly. The driven member (4) can now be placed on the shaft (18). If the splines on either the shaft or the driven member are burred or damaged, causing the driven member to stick, the shaft should be replaced. The driven member should slide freely but without excess play on the shaft.

REPAIR SECTION

ENGINE CLUTCH - Continued

Reassembly of the Engine Clutch - Continued

Any parts that show discoloration due to excessive heat should be replaced. The face of the flywheel should be checked. If it is rough, it should be removed and smoothed. Use emery cloth or reface with a lathe.

Replacement of the Engine Clutch

To replace the clutch in the tractor, drive the pilot bearing (23) into the flywheel first. Then lower the clutch into the main frame. Push the clutch shaft (18) into the pilot bearing. Line up the capscREW holes in the back plate (31) with those in the flywheel, and then run in the capscREWS.

Set the clutch release fork (10) into position so that the bushings (3) and (11) at the bottom line up correctly with the pins of the carrier (9). Be sure the bushings are replaced with the flange facing the sleeve (5). Also be sure the lubricator fitting (39) is on the top side of the carrier.

Slide the release shaft (2) through the main frame bushing into the release fork (10). The keys (1) should be inserted in the shaft and the shaft driven into position in the fork. Turn the shaft around

and continue driving until it emerges on the opposite side of the main frame.

Assemble the clutch hand lever to the end of shaft (2), replace the capscREW, and put the two capscREWS in the release fork (10). Be sure the fork is centered over the carrier (9).

Push the clutch all the way forward to replace the coupling (19), with the teeth in the ring (21) engaging those on the coupling. Engage one of the bolts (43) in the clutch shaft to hold the coupling in place. Line up the holes in disc (17) and push in the rest of the bolts (43). Replace and tighten the nuts, and bend the locks. The coupling can be turned to make each one of these accessible. Place one coupling washer (20) against the ring (21) and replace the ring bolts (45) and the bolt locks (22). Then do the same with the lower half of the washer. Pry the ring bolts into the flange, tighten them, and bend the locks.

Adjust the clutch according to instructions in the "Operations Section".

Replace the clutch cover, assemble the two capscREWS on each side under the two fenders, and replace the bottom of the air cleaner.

REPAIR SECTION

MEMORANDA

REPAIR SECTION

FINAL DRIVE

Drive Bevel Gear

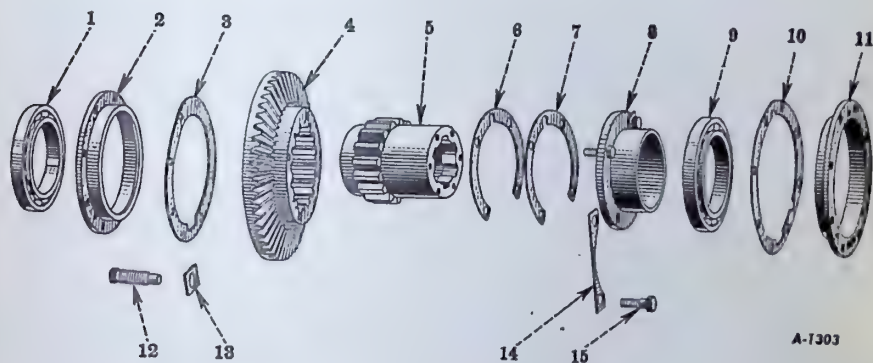
The drive bevel gear assembly is located in a separate compartment directly behind the transmission and between the two steering clutch compartments. The bevel gear and pinion are lubricated from the transmission compartment. Two leather oil seals prevent oil from

entering the steering clutch compartment.

Preparation for Removal of the Drive Bevel Gear

Remove the seat, batteries, and fuel tank.

Drain the oil from the transmission. Remove the main frame cover as



Illustr. 1
Exploded View of the Drive Bevel Gear.

| Ref. No. | Description |
|----------|---|
| 1 | Bearing. |
| 2 | Cage, left hand. |
| 3 | Gasket. |
| 4 | Bevel pinion and shaft with drive bevel gear. |
| 5 | Hub. |
| 6 | Shim, heavy. |
| 7 | Shim, light. |
| 8 | Spacer. |
| 9 | Bearing. |
| 10 | Gasket. |
| 11 | Cage, right hand. |
| 12 | Set screw. |
| 13 | Screw lock. |
| 14 | Lock. |
| 15 | Bolt. |

REPAIR SECTION

FINAL DRIVE - Continued

Preparation for Removal of the Drive Bevel Gear - Continued

described under "Preparation for Removal of the Transmission" in Section 13.

Remove the steering clutches as described under "Steering Clutches" in Section 11.

Removal of the Drive Bevel Gear

Assemble puller capscrews to the tapped holes in the right-hand bearing cage (11), *Illust. 1*. Run them up evenly and remove the cage and gasket (10). Loosen the set screw (12) in the left steering clutch compartment. Bend back bolt locks (14) and remove the bolts (15) in the spacer (8) and the gear (4). Pry the gear and spacer apart and remove shims (6) and (7).

Assemble puller capscrews to the tapped holes in the left bearing cage (2), run them up evenly, and remove the cage with the bearing (1), and the gasket (3).

Drive the hub (5) to the right, out of the ring gear, forcing the spacer (8) and the bearing (9) with it. The bearing can be pulled from the hub (5), and the spacer (8) slid off. The gear (4) can be lifted from the compartment.

Repair of the Drive Bevel Gear

If the bevel gear is to be replaced with a new one, the bevel pinion should also be replaced at the same time. These parts are furnished in matched pairs.

Replacement of the Drive Bevel Gear

Clean the compartment before replacing the assembly. Clean it again after the assembly is completed.

Assemble the left-hand bearing (1) to the bearing cage (2). The outer race of bearings (1) and (9) are narrower than the inner race. The races of the bearings are flush on one side. Assemble the bearings to the bearing cages so that the flush side is always to the left, or so that the projection side of the inner race is toward the right side.

With gasket (3) secured to the bearing cage (2) in which bearing (1) is assembled, place the unit in the left bore from the steering clutch compartment. Assemble the left bearing cage cap (4), *Illust. 1*, Section 11, to the bearing cage (2), *Illust. 1*, and bolt the cap and the cage to the main frame.

Place the bevel gear (4) in the compartment. Insert hub (5) through the right steering clutch compartment into the bore of the bevel gear. Engage the spline of the hub with that in the bore of the gear. Drive the assembly into the bore of the bearing (2) until the spline of the hub strikes the inner race of the bearing.

Place the same number of shims as removed against the bevel gear and slide the spacer (8) into position against the spline of hub (5). Start the bolts (15) with locks (14) in the spacer and gear.

Assemble the right-hand bearing (9) to the bearing cage (11), with the flush side of the bearing to the left and the projection of the inner race to the right. Attach gasket (10) to the bearing cage and push it in place over the hub.

Remove the left-hand bearing cage cap.

Assemble the steering clutch shaft coupling to the left and right ends of hub (5).

REPAIR SECTION

FINAL DRIVE - Continued**Replacement of the Drive Bevel Gear - Continued**

Assemble the bearing cage caps (4), *Illust. 1*, Section 11, to the bearing cages (2) and (11), *Illust. 1*, and draw all bolts tight.

Now draw all bolts (15) tight, revolving the gear with the transmission in neutral to make each one accessible.

Adjustment of the Drive Bevel Gear

Check the backlash of the gears. This can be done by wedging the transmission gears and rocking the bevel gear back and forth. A dial indicator touching the face of one of the teeth in the ring gear will give the exact backlash, which should be .014 in. To increase the backlash to this amount, remove bolts (15) and add shims between the spacer (8) and the gear (4).

If a new bevel gear and pinion have been installed, the pinion must be adjusted for the proper cone setting of the pinion teeth with those of the gear. This is done before replacing the transmission and main frame cover. Do not draw up the bolts tight in the spacer and gear and omit the instructions in the preceding paragraph.

Place a .625" gauge between the toe end of the pinion and the machined diameter of the bevel gear's hub (5). Drive the bevel pinion shaft to the rear so that this gauge can be held in place. This gauge may be made from 5/8" key stock, 5/8" drill rod, or any narrow object 6" long, measuring .625" in diameter. Since there are slight variations in key stock and drill rod, select a piece exactly to size. With the pinion held firmly against the gauge and gear hub, insert the proper number of shims at the pinion shaft front bearing cage to establish the cor-

rect position of the pinion with the .625" gauge in place. If, when turning the bevel gear over, a slight runout on the gear hub or spacer is noted, set the gauge between the tightest and lowest points.

Now adjust the shims between the bevel gear and spacer to obtain the backlash specified above.

As an extra check, apply red lead or Prussian blue to the teeth of the pinion. Powdered red lead mixed with a small amount of oil can be formed into a cake and applied to the pinion teeth with a stencil brush. Revolve the gears in the forward direction, using the pinion to drive the gear. Inspect the teeth of the pinion where the paint has been removed. The tooth bearing resulting will be on the toe end of the teeth and should be centered up and down on the active portion of the tooth profile. If the profile bearing is high, use less shims at the front end of the pinion shaft. If the profile is low, use more shims. Recheck the backlash when shims are added or subtracted from the pinion shaft.

Set the bevel gear deflection set screw (12) to .020" clearance between the end of the screw and the back side of the bevel gear. Bend back the lock (13) after making the adjustment.

The bearing cage caps (4) and the clutch couplings (1), *Illust. 1*, Section 11, can now be removed so that the steering clutches can be assembled.

Assemble the steering clutches, transmission, and main frame cover, and other items removed. Be sure to refill the transmission case with the proper grade of lubricant.

REPAIR SECTION

FINAL DRIVE - Continued

Sprockets and Sprocket Drive

The power is transmitted from the drive bevel gear through the steering clutches to the sprocket drive gears and sprockets which are ball-bearing mounted on the stationary pivot shaft. These bearings are sealed with labyrinth bracket seals in two self-adjusting, floating-diaphragm type seals. Each sprocket is reversible. It can be removed from its hub, reversed, and placed back on the same side of the tractor, thereby utilizing both sides of the teeth.

Removal of the Sprockets and Sprocket Drive

Lock the steering brakes and support the steering clutches when removing the sprocket drive parts. Take off the track chain as outlined in Section 12. Then remove the capscrews from the stabilizer roller guide. The track frame is freed at the front by putting a jack under the front stabilizer, and raising it sufficiently to take the load off the equalizer spring. Remove capscrews from the diagonal brace bearings at the pivot shaft.

Lift off the sprocket shield (57), *Illust. 2*, after the capscrews in the bracket (51) and bolts in the track frame have been removed. The track pivot cap (55) and gasket (54) come off after removing four capscrews.

Remove capscrews from the pivot bearing (53) and the pivot bracket (51). Jack up the rear of the tractor on the side being worked on. Slide off the pivot bearing (53) with the bracket (51), and items (48), (49), (50), (65), (66), and (67). The packing (64) may be lifted from the dirt deflector (63).

Remove the capscrews which hold the dirt deflector (63) to the bearing cage (59). Lift off the dirt deflector (63), the retainer (62) and gasket (61). Assemble puller capscrews to the bearing cage (59). Run up capscrews evenly and pull the bearing cage (59) with bearing (60) and gasket (47). Bend back nut lock (45) and unscrew the nut (46). The service tool SE-1184-2 fits the nut (46). The sprocket (44) with its carrier (31) and dirt deflector (30) can be pried from the splined hub of the gear (20). The sprocket (44) may be removed from the carrier (31) and reversed for getting double the wear from the sprocket.

If the gear cover (23) or the carrier (34) are to be removed, a different procedure is necessary for both regular and wide-tread tractors. Refer to the heading concerning the tractor on which you are working.

Wide Tread Tractors

Lift out the packing (29) and remove capscrews in the dirt deflector (27). This will allow the retainer (25), diaphragm (26), dirt deflector (27), pressure plate (28), and springs (42) to be removed as a unit. Remove capscrews in the cap (17) and lift it off. Remove capscrews, bolts and nuts around gear cover (23) and turn puller capscrews into the tapped holes provided. Pull the gear cover (23) with gasket (22) and dowels (24). Bearing (15) will come off with cover (23) as will possibly the pinion (12). If not, the pinion (12), with bearing (11), can be pried from the carrier (34). The gear (20) can now be pried from the pivot shaft (52) with bearing (37) and spacer (21). The spacer (36) may now be slid from the pivot shaft.

REPAIR SECTION

FINAL DRIVE - Continued

Wide Tread Tractors - Continued

To remove the carrier, it will be necessary to take off the inspection covers on top of the main frame cover near the steering clutch release fork, and support the steering clutches with a rope attached to a chain hoist. Remove the lock bolts (7) from the bearing nut (6), and turn the nut off pinion shaft (1). Remove nuts and bolts from the carrier (34). Assemble puller capscrews, run them up evenly, and pull the carrier from the main frame with bearing retainer (2), gasket (3), oil seal (4) with bearing (5), and dowel pins (18). The ring (32) fitting in the groove in the main frame around the pivot shaft (52) can now be removed.

pivot shaft (52) with bearing (37) and spacer (21). The short spacer (36) may be slid from the pivot shaft.

To remove the carrier plate (34), it will be necessary to take off the inspection covers on top of the main frame cover, near the steering clutch of release fork, and support the steering clutch with a rope attached to a chain hoist. Remove the nuts and bolts from the carrier plate (34), assemble puller capscrews, run them up evenly, and pull the carrier from the main frame with oil seal retainer (2), gasket (3), oil seal (4), bearing (5) and dowel pins (18). The ring (32) fitting in the groove in the main frame around pivot shaft (52) can be removed.

Regular Tread Tractors

Lift out the packing (29) and remove capscrews in the dust deflector (27). This will allow the retainer (25), diaphragm (26), dust deflector (27), pressure plate (28) and springs (42) to be removed as a unit. Remove capscrews from cap (17) and lift it off. Remove capscrews and lift off the pinion bearing retainer. Remove capscrews, bolts and nuts around the gear cover (23) and turn puller capscrews into the tapped holes provided. Pull the gear cover (23) with gasket (22) and dowels (24). Bearing (15) will come out with cover (23) as will possibly the pinion (12). If not, the pinion (12) with bearing (11) can be pried from the carrier (34). The gear (20) can now be pried from the

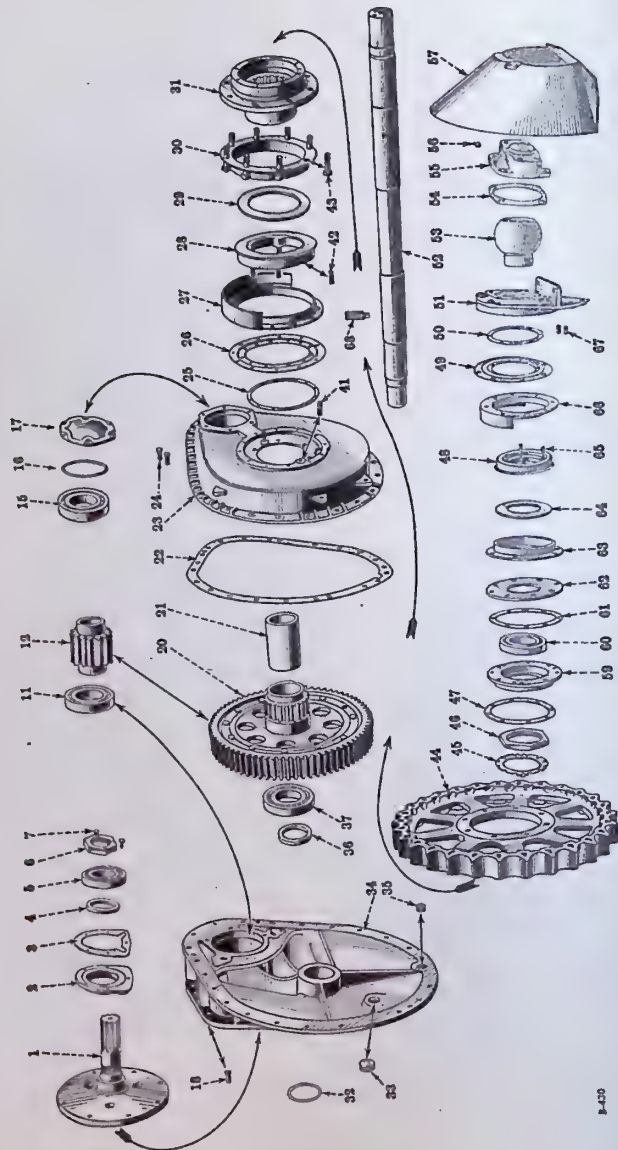
Replacement of the Sprocket Drives

To replace the sprocket drives, the removal procedure can be reversed. The oil seal (4) should be placed in the oil seal cage so that the lip of the seal will face the pinion (12). When pressing the bearing cage (59) with the bearing (60) into the carrier (31), be sure to line up the capscrew holes in the bearing cage with those in the carrier. When replacing diaphragm seals, test the action of the seals first. Be sure the anchor pins (41) enter the holes in the pressure plate (28), and also be sure that the anchor pins (67) in the bracket (51) fit into pressure plate (48).

REPAIR SECTION

FINAL DRIVE - Continued

Sprocket Drive Assembly

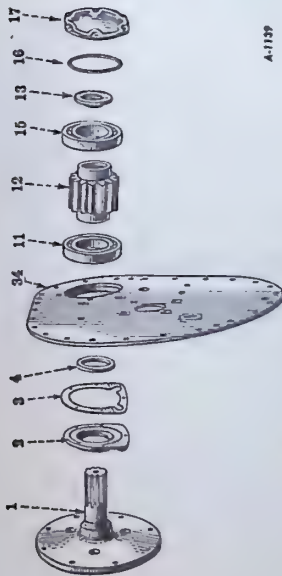


Illustr. 2

Exploded View of the Sprocket Drive Assembly.

REPAIR SECTION

FINAL DRIVE - Continued

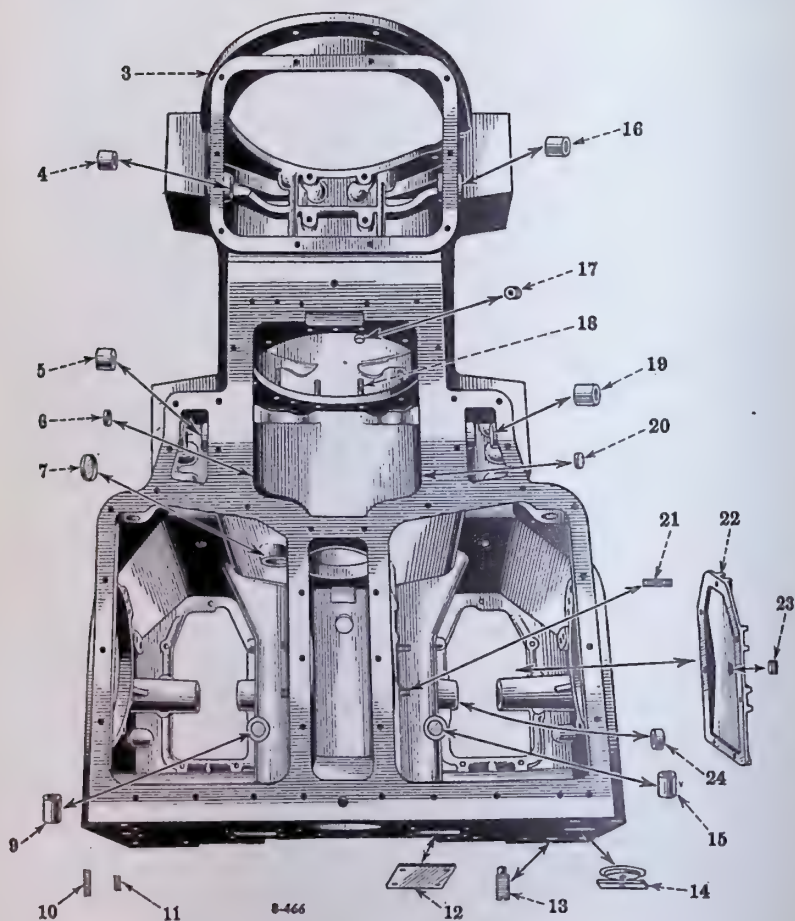
Sprocket Drive Assembly
- Continued

The illustration to the left, applies to the regular tread tractors only. Items with similar numbers shown above, as well as items 5, 6, 7 and 18, apply only to wide tread tractors.

A-1139

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|-----------------------------------|----------|---------------------------------|----------|--------------------------|----------|---------------------------|
| 1 | Pinion shaft. | 20 | Gear (68 teeth) and carrier. | 36 | Spacer, short. | 55 | Cap (track pivot). |
| 2 | Bearing retainer with oil seal. | 21 | Spacer, long. | 37 | Bearing. | 56 | Lubricator (track pivot). |
| 3 | Bearing retainer gasket. | 22 | Gasket. | 41 | Anchor pin. | 57 | Shield (sprocket). |
| 4 | Oil seal. | 23 | Cover with anchor pins. | 42 | Spring. | 59 | Cage. |
| 5 | Bearing. | 24 | Dowel pin. | 43 | Bolt. | 60 | Bearing. |
| 6 | Bearing nut. | 25 | Retainer. | 44 | Sprocket (29 teeth). | 61 | Gasket. |
| 7 | Lock bolt. | 26 | Diaphragm. | 45 | Lock. | 62 | Retainer. |
| 11 | Bearing. | 27 | Guard. | 46 | Nut. | 63 | Deflector (track frame). |
| 12 | Sprocket drive pinion (13 teeth). | 28 | Pressure plate. | 47 | Gasket. | 64 | Packing. |
| 13 | Washer (not illustrated). | 29 | Packing. | 48 | Pressure plate. | 65 | Spring. |
| 15 | Bearing. | 30 | Deflector. | 49 | Diaphragm. | 66 | Guard. |
| 16 | Packing ring. | 31 | Carrier. | 50 | Retainer. | 67 | Anchor pin. |
| 17 | Cap with packing ring. | 32 | Ring (track frame pivot shaft). | 51 | Bracket. | 68 | Pivot shaft set screw. |
| 18 | Pin. | 33 | Plug, 1-1/2". | 52 | Track frame pivot shaft. | | |
| | | 34 | Carrier with pipe plugs. | 53 | Pivot bearing. | | |
| | | 35 | Plug, 3/4". | 54 | Gasket (track pivot). | | |

FRAME



Illustr. 1
Exploded View of the Main Frame.

See opposite page for descriptions.

REPAIR SECTION

FRAME - Continued

Main Frame

A heavy, reinforced casting houses the engine clutch, transmission, bevel gear and pinion, steering clutches, and steering brakes. Heavy channels of steel are securely bolted to the main frame casting and tied in front by the heavy radiator base. This rugged foundation absorbs stresses and strains.

Track Frame

The front idler, track idlers, and track rollers are secured to the heavy, welded-steel, channel-constructed track frames. They are pivoted by a ball and socket on

the ends of the pivot shaft. Each track is free to oscillate vertically independent of one another. This prevents leverage strains being imposed on the pivot shaft (1), *Illust. 2*, due to the slight lateral deflection of the track frame. The equalizer spring contacts the track frame, and the roller-type stabilizers (3) maintain the track spacing (heavy braces and brackets attach to the main frame side channels and carry the stabilizer rollers; roller guides are bolted to the track frame assembly). Heavy steel diagonal braces (4) are bearing-mounted at the center of the pivot shaft. They keep the track frame in upright position but allow vertical oscillation.

See Illustration on opposite page.

| Ref. No. | Description | Ref. No. | Description |
|----------|---|----------|--|
| 3 | Main frame. | 15 | Steering clutch release shaft bushing. |
| 4 | Engine clutch release shaft bushing. | 16 | Engine clutch release shaft bushing. |
| 5 | Steering brake lever outer bushing. | 17 | Socket head pipe plug, 1-1/2 inch. |
| 6 | Steering brake operating shaft plug. | 18 | Transmission end cover stud. |
| 7 | Reverse idler shaft plug. | 19 | Steering brake lever outer bushing. |
| 9 | Steering clutch release shaft bushing. | 20 | Steering brake operating shaft plug. |
| 10 | Drawbar guide bracket stud, upper. | 21 | Bevel gear bearing cage stud. |
| 11 | Drawbar guide bracket stud, lower. | 22 | Steering brake inspection cover. |
| 12 | Main frame rear inspection cover. | 23 | Drain plug. |
| 13 | Track frame pivot shaft set screw. | 24 | Brake pivot shaft cup plug. |
| 14 | Steering clutch lubricating port cover. | | |

REPAIR SECTION

FRAME - Continued

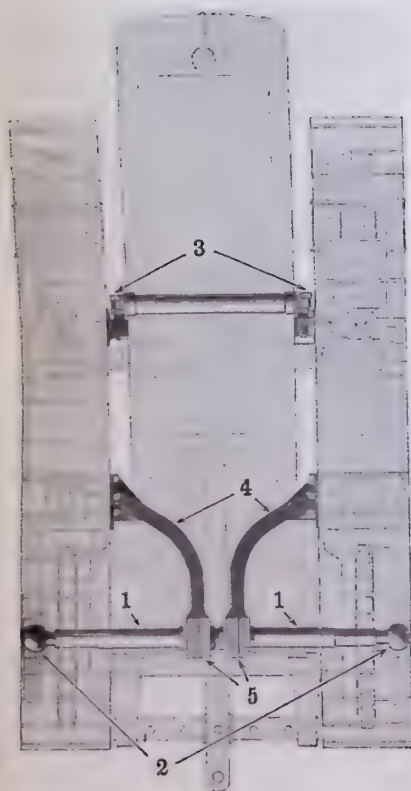
Removal of the Track Frame

Take off the track chain, place a jack under the stabilizer brace, and raise the front of the tractor enough to take the load of the equalizer spring from the track frame. Take out the bolts in the roller guide. Put a jack under the drawbar. Then disconnect the diagonal brace at the pivot shaft. Take out the bolts in the sprocket shield and pivot bearing bracket. The frame can then be slid out of place.

Disassembly of the Track Frame

Remove the guard (1), *Illust. 3*. The outer (12) and inner (13) track shields can be taken off after the bolts have been removed from the frame (7). To release the track rollers (10) and (11), remove the bolts from the roller brackets. Jack up the nearest end of the track frame and lift the rollers out.

Then remove the capscrews from the cover plate (3) and remove the plate. After loosening the lock bolt in front of the spring retainer (8), unscrew the idler adjuster (4).



Illust. 2
Track Stabilizer Construction.

1, Track Frame Pivot; 2, Ball-and-Socket Pivot Bearings; 3, Front Stabilizer; 4, Diagonal Braces; 5, Diagonal Brace Pivot Bearings.

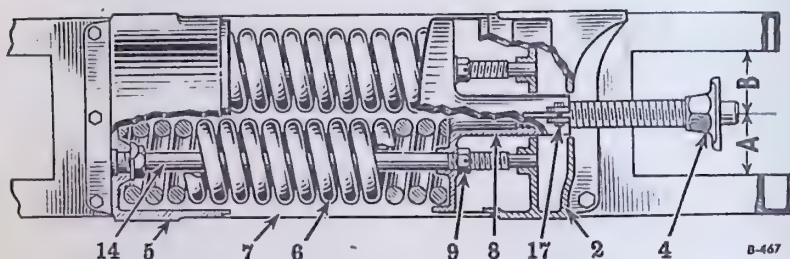
REPAIR SECTION

FRAME - Continued

Disassembly of the Track Frame
- Continued

Remove the bolts from the spring guide (2) and the frame (7). The spring guide and the top idler can be slid forward and removed. Compression in the springs (6) can be relieved by unscrewing nut (9) after taking out the cotter keys.

Unscrew each nut the same amount to relieve compression evenly. The springs (6) can then be pulled off the spring adjusting rod (14). Then remove capscrews from the retainer (5) and lift it off the frame (7). After bending back the lockwasher (15) for the spring adjusting rod (14), and removing the lock nut (16), the spring adjusting rod can be slid out.



Illustr. 4
Cross Section of the Track Front Idler
Recoil Spring Assembly.

2. Recoil Spring Guide; 4. Idler Adjuster Rod; 5. Rear Spring Retainer; 6. Recoil Spring; 7. Track Frame; 8. Front Spring Retainer; 9. Castellated Nut; 14. Spring Adjusting Rod; 17. Adjuster Rod Lock Bolt.

Reassembly of the Track Frame

Place the rear retainer (5) on the frame (7) and run in the capscrews. Insert the spring adjusting rod (14) in the retainer (5). Place the lockwasher on it and run up the lock nut (16). Then bend back the lockwasher.

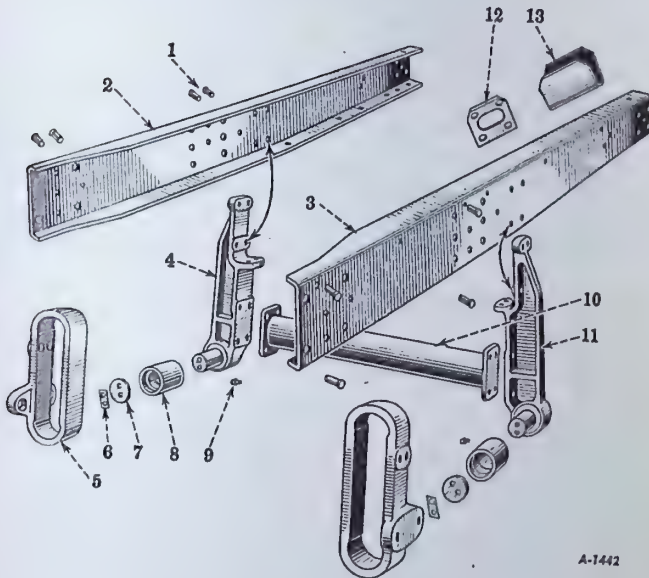
Slide the compression springs (6) over the spring adjusting rod. Bring the front retainer (8) into position on the adjusting rod (14), and run up nuts (9) until cotter keys can be placed through them and also through the adjusting rod. The nuts must be run up evenly to compress the springs (6) without danger of cocking the retainer (8)

on the rods (14). The end of the retainer (8) should be centered between the panels of the track frame (7). (See A and B of Illustr. 4.)

Place the spring guide (2) on the frame so that the adjusting rods (14) enter the two holes in the guides. Run in the idler adjuster (4). After final adjustment, the lock bolt (17) in the front retainer (8) should be tightened. Adjust nuts (9) to make the idler adjuster (4) parallel with the frame (7). It should not be cocked to the side because this causes the tractor to creep to one side and increases track wear. Bend the cotter keys in nuts (9) and replace the cover plate (3).

REPAIR SECTION

FRAME - Continued



Illustr. 5

Exploded View of the Track Frame Guide.

| Ref. No. | Description | Ref. No. | Description |
|----------|-------------------------------|----------|--------------------------------|
| 1 | Dowel. | 8 | Roller. |
| 2 | Channel, left hand. | 9 | Lubricator. |
| 3 | Channel, right hand. | 10 | Bracket brace. |
| 4 | Bracket, complete, left hand. | 11 | Bracket, complete, right hand. |
| 5 | Guide. | 12 | Starting crank support plate. |
| 6 | Capscrew lock. | 13 | Starting crank support clamp. |
| 7 | Washer. | | |

REPAIR SECTION

FRAME - Continued

Reassembly of the Track Frame - Continued

Replace the five track rollers (10) and (11). Assemble the guard (1) to the spring guide (2) and the retainer (5). Then shields (12) and (13) can be secured to the frame.

Replacement on the Tractor

The track frame assembly is replaced on the tractor in the reverse order of removal.

Track Frame Pivot

A heavy pivot shaft (52), *Illust. 2*, Section 5, extends through the rear of the tractor from track to track. The driving sprockets (44) revolve around this stationary axle. The track frames are mounted on this same axle through a ball and socket joint (51), (53), and (54), thus eliminating any twist or leverage loads at this point. Heavy steel diagonal braces bolted to the track frames are pivoted at midpoint of this shaft.

The pivot shaft needs replacement only in case of breakage. To remove the pivot shaft, it is advisable to pull the pin from the front end of the drawbar, and remove the capscrews from each diagonal brace at the pivot shaft. Jack up the tractor at the rear end, remove the sprocket drive gears and housing down to the main frame. Remove the

diagonal brace bearings from the pivot shaft. Remove the drawbar braces. Remove the pivot shaft set screw (68), and scrape the paint away from the pivot shaft at the center.

When replacing the pivot shaft, be sure to install new rubber rings between the main frame and the carrier casting.

Track Frame Guide

The track frame guides which maintain the track spacing consist of rollers (8), *Illust. 5*, attached to brackets (4) and (11) bolted to the main frame side channels (2) and (3), and the guides (5) attached to the recoil spring guides (2), *Illust. 3*. The bracket brace (10), *Illust. 5*, maintains the roller spacing.

To remove the track frame guide assembly, jack up the front of the tractor at the radiator. Then remove the bolts in the bracket brace (10), the brackets (4) and (11), and the guides (5). Lift off the guides and drive the brackets off the dowel pins (1).

The rollers can be removed from the brackets by bending the capscrew lock (6), taking out the capscrews, and sliding off washers (7) and rollers (8).

Replacement of the guides is the reverse of removal.

REPAIR SECTION

FRAME - Continued

Track Frame Diagonal Brace

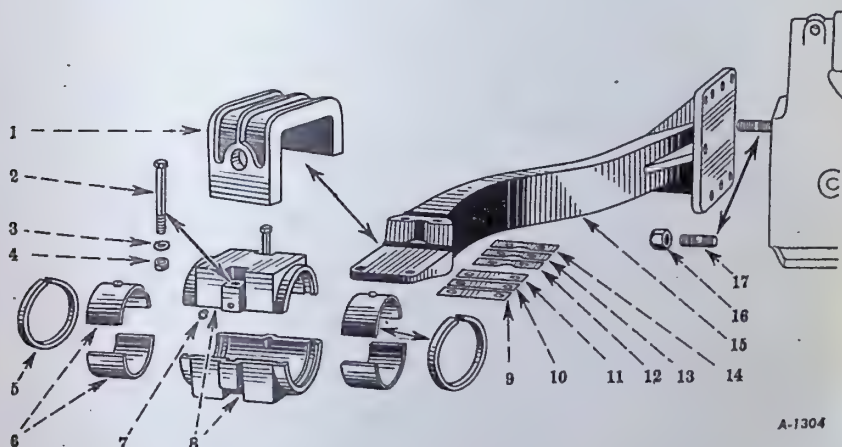
The diagonal brace (15), *Illust. 6*, keeps the tracks in vertical alignment and extends from a fixed position on the track frame to a pivot bearing on the pivot shaft at the center of the tractor.

This unit can be disassembled by removing nuts (16) from the studs (17) in the track frame. After removing clamp (1), the brace (15) can be let down. When nut (4) is taken off, bolts (2) can be pulled out and the bearing (8) slipped off.

Felts (5) can be pulled out. Use new, oil-soaked felts for replacement.

If the bushings (6) are only slightly worn, play can be removed by displacing the proper shims (9) to (12), (10) to (13), or (11) or (14). If replacement is desired, the bushings can be removed with a screwdriver. They are replaceable, furnished to size.

Reassembly of the diagonal brace is the reverse of disassembly.



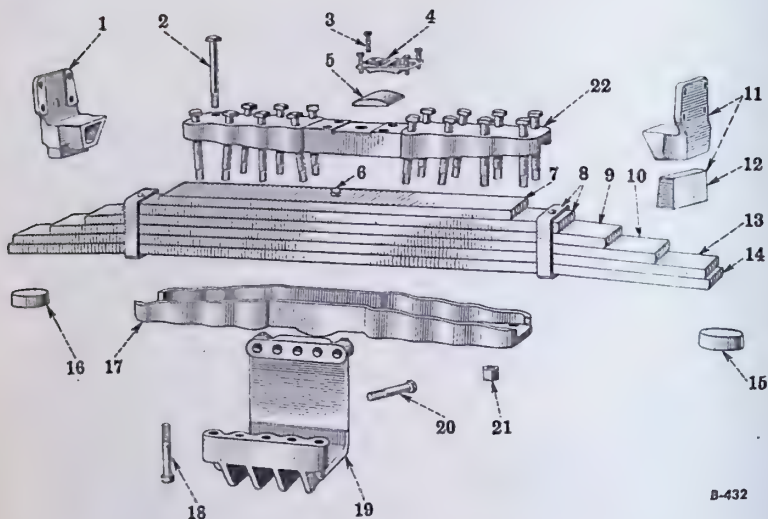
A-1304

Illust. 6
Exploded View of the Diagonal Brace.

| Ref. No. | Description | Ref. No. | Description |
|----------|---------------------------------|----------|----------------------------|
| 1 | Clamp. | 10 | Shim, outer (heavy). |
| 2 | Bolt, 1/2 x 4 inch N.F. | 11 | Shim, outer (medium). |
| 3 | Lock washer, 1/2" (Shakeproof). | 12 | Shim, inner (extra heavy). |
| 4 | Nut, 1/2 inch N.F. | 13 | Shim, inner (heavy). |
| 5 | Felt. | 14 | Shim, inner (medium). |
| 6 | Bushing (set of 4). | 15 | Brace, left hand. |
| 7 | Lubricator. | 16 | Brace, right hand. |
| 8 | Bearing. | 17 | Nut. |
| 9 | Shim, outer (extra heavy). | | Stud. |

REPAIR SECTION

FRAME - Continued



Illustr. 7
Exploded View of the Equalizer Spring.

| Ref. No. | Description | Ref. No. | Description |
|----------|--|----------|---------------------------------|
| 1 | Bumper pad bracket with pad, right hand. | 12 | Bumper pad. |
| 2 | Saddle bolt. | 13 | No. 2 leaf. |
| 3 | Dowel bolt, upper. | 14 | No. 1 leaf. |
| 4 | Pad, upper. | 15 | Guide pad. |
| 5 | Wearing pad. | 16 | Guide pad. |
| 6 | Center bolt and nut. | 17 | Saddle, lower. |
| 7 | No. 6 leaf. | 18 | Dowel bolt. |
| 8 | No. 5 leaf with clip. | 19 | Frame pad, lower. |
| 9 | No. 4 leaf. | 20 | Dowel bolt. |
| 10 | No. 3 leaf. | 21 | Saddle bolt nut. |
| 11 | Bumper pad bracket with pad, left hand. | 22 | Saddle with wearing pad, upper. |

Equalizer Spring

The equalizer spring is removed from the tractor by jacking up the front end of the tractor, removing the track frame from one side of the tractor, and running out the dowel bolts (18) and (20), *Illustr. 7*. Be careful to support the spring in doing so because the lower frame pad (19) is now free along with the entire equalizer spring assembly.

The entire assembly can now be removed from the tractor.

Disassembly of the Equalizer Spring

Remove the bolts (2) from the upper (22) and lower (17) saddles. If necessary, the wearing pad (5) can be disengaged from the upper saddle (22) by removing the rivets in the pad.

REPAIR SECTION

FRAME - Continued

Disassembly of the Equalizer Spring - Continued

The top leaf (7) can be lifted off when the center bolt (6) is taken out.

If it is necessary to replace damaged springs, remove clips on both ends of No. 5 leaf (8), thus freeing the leaves (8), (9), (10), (13) and (14).

Reassembly of the Equalizer Spring

Reassembly is the reverse of disassembly. To facilitate reassembly, however, assemble all the leaves. Then replace the center bolt (6) to align the leaves. The upper pad (4) is attached to the bottom of the main frame with the special dowel bolts (3).

Rigid Track Frame

(Used in place of Equalizer Spring, etc., when the TracTrac-Tor is equipped with Cranes, Pipe Booms, and similar superimposed Equipment.)

The rigid track frame is a term used to specify the action of the

track frame when the equalizer spring is replaced with a rigid cross bar. The removal procedure for this type of unit is similar to the removal of the equalizer spring.

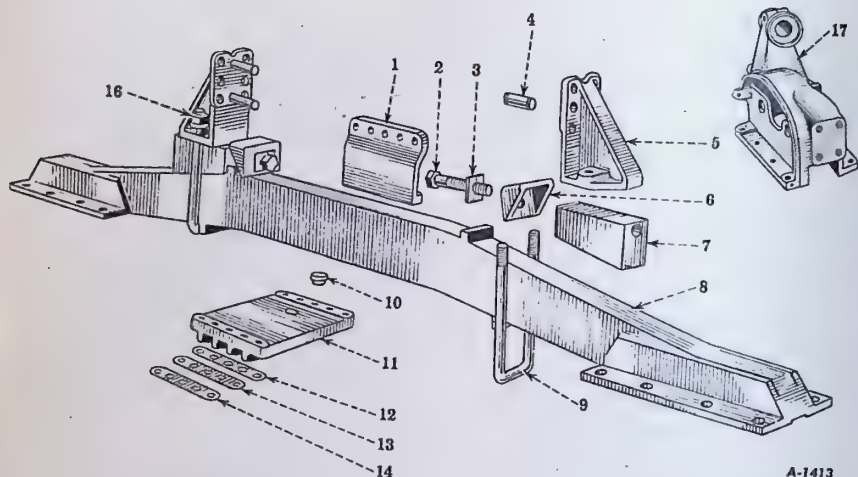
Jack up the tractor at the front just enough to relieve the cross bar of the engine weight. Remove the track chain on both sides. Remove the front idlers and turn out the front idler adjusters (4), *Illust. 3.* Take off the recoil spring guards (1). Take out the bolts in the rear spring retainer (5) and withdraw the spring retainer with the recoil spring assembly.

Take out bolts and lift off the recoil spring guides (2). Remove the bolts holding clamp support (1), *Illust. 8,* and clamp (11) to the main frame. Remove the nuts from the "U" bolts (9). Jack up the front end some more so that the wedge clamps (6) clear the lugs on the cross bar. Pull the cross bar (8) out the front. The brackets (5) are doweled (4) to the main frame side channels.

Replacement of the rigid frame cross bar is reverse of the removal procedure.

REPAIR SECTION

FRAME - Continued



A-1413

Illustr. 8

Exploded View of the Rigid Track Frame Crossbar.

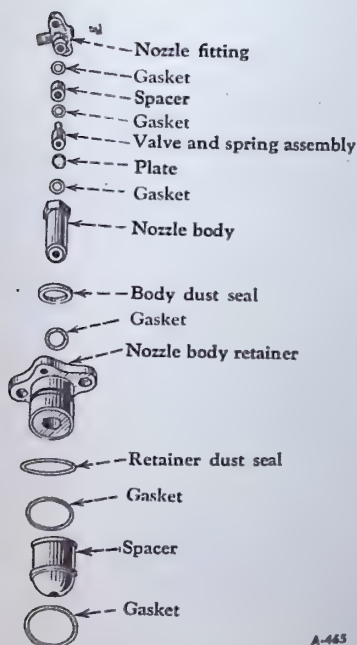
| Ref. No. | Description | Ref. No. | Description |
|----------|--------------------------------|----------|------------------------------------|
| 1 | Cross bar clamp support. | 10 | Cross bar dowel. |
| 2 | Cross bar wedge bolt. | 11 | Cross bar clamp. |
| 3 | Cross bar wedge bolt lock. | 12 | Cross bar clamp shim, medium. |
| 4 | Cross bar bracket dowel. | 13 | Cross bar clamp shim, heavy. |
| 5 | Cross bar bracket, left hand. | 14 | Cross bar clamp shim, extra heavy. |
| 6 | Cross bar bracket, right hand. | 16 | Cross bar bracket "U" bolt nut. |
| 7 | Cross bar wedge clamp. | 17 | Track idler support, front. |
| 8 | Cross bar wedge. | | |
| 9 | Bar bracket "U" bolt. | | |

REPAIR SECTION

FUEL SYSTEM

Injection Nozzles

The injection nozzle assembly consists principally of the nozzle, the nozzle body retainer, and the spacer or precombustion chamber. There are three copper gaskets inside the nozzle body. The first is below the nozzle plate, the second is between the spacer and the valve-and-valve-spring assembly, and the third is between the spacer and the nozzle fitting (*Illusts. 1 and 2*). Use new gaskets if possible whenever servicing nozzle parts. Another copper gasket is located between the nozzle body and the retainer. Steel gaskets are located above and below the spacer.



A-463

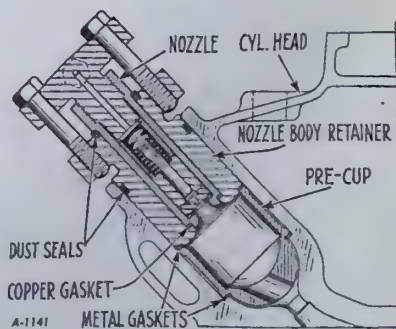
Illust. 1

Exploded View of an Injection Nozzle.

NOTE: When replacing the nozzle body spacer be sure it is assembled with the word "UP" toward the top of the cylinder head.

The injection nozzles have a counterbore and a groove in the nozzle body retainers to accommodate dust seals. When assembling these seals, apply a light coating of potash soap solution to the seal. Roll it onto the nozzle body retainer and insert the assembly into the cylinder head bore. Tighten the nuts holding the nozzle body retainer to the cylinder head to 45 ft.-lbs. torque.

The injection nozzles can be readily removed by taking out two cap-screws and disconnecting the fuel injection pump tubing. The assembly should be clean and free of carbon. To clean the nozzle, unscrew the nozzle fitting from the nozzle body. Check the length of the nozzle valve spring as it is assembled before dismantling. It will make reassembly to the proper tension much easier. The correct pressure of the assembled springs should be 34 to 35 lbs.



Illust. 2

Cross Section of an Injection Nozzle.

REPAIR SECTION

FUEL SYSTEM - Continued

Injection Nozzles - Continued

The nozzle should be checked with the hydraulic test pump SE-905-A for correct opening pressure as follows:

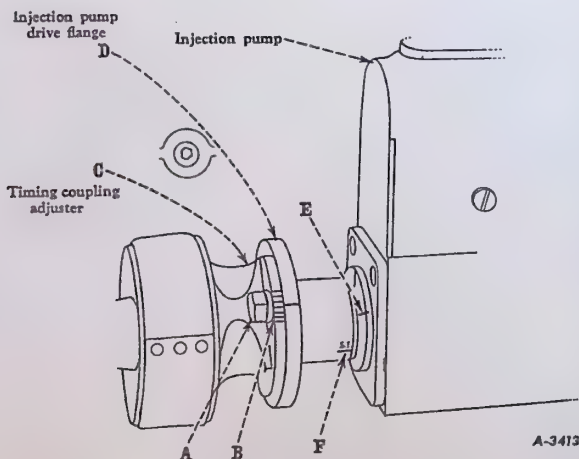
The leakage past the valve at 700 lbs. per sq. in. pressure should not exceed five drops per minute. The valve should be set to open at 700 lbs. per sq. in. pressure. Re-adjust the spring if necessary. Before testing the nozzle draw down the nozzle fitting to the nozzle body with a torque wrench to 90 ft.-lbs. torque. Capscrews holding the nozzle body and fitting in the nozzle body retainer should be drawn down to 20 ft.-lbs. torque.

If a smoky exhaust condition exists in one cylinder it can be traced by opening successively the fuel bleeder screw in each nozzle. The clearing of smoke on opening any one bleeder screw indicates a leaky injector valve in that nozzle. This is particularly true of a light exhaust condition. Dirty nozzles and poor fuel will cause a light or dark blue smoke. The leaky nozzle valve, improper timing of the injector, poor fuel, and insufficient

air are several of the causes for a heavy brown or black exhaust smoke. A knocking condition confined to one cylinder very often is caused by a leaky nozzle valve, a dirty fuel pump delivery valve, a broken delivery valve spring, sticky or warped intake or exhaust valves, and a leaky cylinder head gasket. Water in the fuel, sticky nozzle valves, or poor fuel will result in a general knocking condition of erratic or intermittent nature.

Fuel Injection Pump

The primary unit of the Diesel fuel injection system is a Bosch flange-mounted injection pump. It is a constant stroke, cam-actuated solid injection type equipped with a variable stroke, self-regulating, plunger-type fuel supply pump. Fuel from the supply tank is pumped through an absorption-type metal and cloth element fuel filter. The injection pump operates at 1/2 engine speed. Air in the fuel system may be bled at the sediment bowl; fuel filters, and injection nozzles as described in the "Operations Section".



A-3413

Illustr. 3
Injection Pump Coupling Showing Timing.

REPAIR SECTION

FUEL SYSTEM - Continued**Fuel Injection Pump - Continued**

The injection pump drive has a timing adjustment between the drive flange and the coupling. This is normally set with capscREW "A", *Illust. 3*, at center of slot "B", and the mark on the drive flange "D" is at the center mark of the graduations on the coupling adjuster "C". Since operating conditions vary, the position of the mark on flange "D" can be tried on either side of the center mark on the coupling adjuster "C".

Loosen the capscREW "A" and set to a position where the engine speed is maximum for a fixed load and the engine runs smoothly with the cleanest exhaust.

The timing coupling is made so that it can be assembled only one way for correct timing of the pump with relation to the crankshaft. The injection pump is timed for port closing of No. 1 cylinder. Set the engine on the gasoline cycle and crank the engine by hand so No. 1 piston approaches top dead center on the compression stroke. Stop cranking when the "SI" mark (meaning start of injection) on the flywheel registers with the timing pointer on the right side of the rear engine support. Turn the pump flange "D" so that the "SI" mark on the pump flange registers with mark "E" on the face of the pump. The "SI" mark is approximately 45° from the vertical.

Whenever the high-pressure tubing is to be disconnected from the fuel injection pump, use two wrenches--one to loosen the pipe fitting and the other to prevent possible turning of the discharge fitting on the pump. Whenever the tubing has been removed place caps over the discharge fittings to prevent the possible entrance of dirt.

**Removal of the
Fuel Injection Pump**

Pry the leather boot (22) *Illust. 11*, Section 3, from the adjuster (23). Remove high-pressure tubing

from the nozzles and injection pump, and place dust caps on the discharge fittings and nozzle fittings. Remove copper tubing from the supply pump and inlet and outlet fittings on the pump. Take the governor control rod from the control lever of the injection pump. Take out four capscREWS holding the pump mounting bracket to the engine crankcase, and lift the pump back and up to remove.

**Replacement of the
Fuel Injection Pump**

If a replacement pump does not have drive flange (24) already attached, mount the flange from the pump removed on the new pump. Similarly, attach adjuster (23) to the flange (24). Attach the overflow pipe to the pump and attach the mounting bracket to the base of the replacement pump. Turn the engine over to the compression stroke for No. 1 cylinder and continue turning until the "SI" mark on the flywheel registers with the opening in the flywheel housing. Turn the pump over so the "SI" mark on the flange (24) registers with the "SI" mark on the front cover of the injection pump. The "SI" mark on the pump is located approximately 45° from the vertical.

Lift the pump into place, enter the overflow pipe into its clip and the prongs on the adjuster into spacer (21). Attach the mounting bracket to the crankcase, and replace fuel lines, high-pressure tubing, and the governor control rod.

Time the pump as outlined in the "Operations Section". See steps 13 to 15 inclusive, "Adjusting Starting Control Mechanism", Section 10. If the engine does not come up to the proper high-idle speed, remove the small cover adjacent to the governor control lever on the pump and adjust the rear set screw to give the speed desired. If the pump does not shut off by closing the throttle, adjust the front set screw to make it do so. Replace the cover and seal.

REPAIR SECTION

FUEL SYSTEM - Continued

Basic Tests and Adjustments of the Bosch Fuel Injection Pump

Fuel injection pumps removed from an engine, as well as those reassembled after servicing, should be operated on a test bench such as the IHC SE-1247 test bench. Fundamentally, such a bench is a means of running the pump at normal operating speeds - with the tractor fuel piping duplicated and graduated containers to catch the fuel delivered from the injection nozzles.

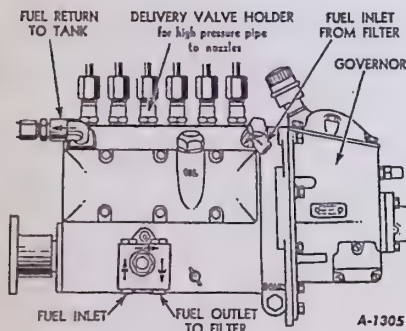
The start of injection for each plunger, the pressure maintained by the fuel supply pump (6 to 8 lbs.), and the quantity of fuel delivered to each cylinder of the engine can be checked. Necessary adjustments can be made and the pump replaced on an engine with a minimum of lost time. Many pumps removed from

full load speed of the engine (1200 R.P.M. engine speed; 600 R.P.M. pump speed). In addition, the drive should include a disc graduated in degrees of a circle, and an adjustable pointer. A gage rod graduated in millimeters or 64ths, attachable to the rear of the injection pump housing, and a pointer to match, attachable to the rear end of the control rod should be provided.

Timing the Bosch Fuel Injection Pump

For timing, attach the injection pump to a suitable bracket aligned with the drive. Thoroughly clean the exterior of the pump and remove the governor assembly as outlined under "Repair of the Bosch Fuel Injection Pump". Attach a fuel line from the source of fuel supply to the inlet fitting on the pump housing. Remove the delivery valve holder (2), *Illust. 6*, from the No. 1 injector, extract the delivery valve spring (3) and delivery valve (5), and replace the delivery valve holder. Move the control rod (45B) so the mark on its underside at the rear is in line with the edge of the bushing. At this position, the split in the control sleeve toothed segments are straight out or perpendicular to the control rod.

Rotate the pump so the No. 1 injector starts to rise -- this can be determined by watching the tapet (71-A) through the inspection cover (38-A) opening. Turn on the fuel supply and carefully continue turning the pump camshaft until the flow of fuel from the delivery valve holder ceases. Set the indicator at zero on the graduated disc or at a recorded number of degrees on the disc. Turn the pump through a complete cycle and again check the position of the pointer on the indicator when the fuel stops flowing from the delivery valve holder. Blowing the fuel from the depression in the top of the delivery valve holder will allow the exact position of fuel



Illust. 4
Bosch Fuel Injection Pump.

engines require only retiming and recalibration.

The test stand should be equipped to drive the injection pump at a speed of 550 R.P.M., and preferably another speed equivalent to the

REPAIR SECTION

FUEL SYSTEM - Continued

Timing the Bosch Fuel Injection Pump - Continued

flow stoppage to be more clearly observed. The pump must be turned very slowly as this point is reached.

When the fuel stops flowing, the "SI" mark on the injection pump gear hub should line up with the "SI" mark on the face of the end plate (15). If the fuel does not stop flowing when these marks line up, the tappet adjusting screw (66) should be: (A) Raised to make the fuel stop flowing sooner, and (B) lowered to make the fuel stop flowing later. The pump turns in a clockwise direction when viewed from the front. The "SI" mark on the end cover is reached approximately 45° after passing the vertical center-line of the pump.

With the flow of fuel stopped at the time the "SI" marks on the hub and end cover line up (adjusted with the tappet screw for No. 1 cylinder), and delivery valve and spring may be replaced. The point at which the fuel stops flowing is called the start of injection and is abbreviated with the letters "SI". Remove the delivery valve for No. 5 plunger and turn the pump to make the fuel stop flowing from that delivery valve holder. The start of injection or stoppage of the fuel flow for this plunger should occur exactly 60° of rotation after that for No. 1 plunger. If the fuel flow stops before 60° of turning has elapsed, the tappet adjusting screw for that plunger should be lowered. If the fuel flow stops after 60° of turning has elapsed, the tappet adjusting screw should be raised. When the tappet adjusting screw is set to make the fuel flow stop exactly 60° after that for No. 1 plunger, the delivery valve and spring may be replaced for this plunger.

Repeat this process for No. 3 plunger. The "SI" for this plunger should be exactly 60° after that for No. 5. When this has been properly adjusted, check the "SI" for plunger No. 6. It should like-

wise be 60° after that for No. 3. Repeat this process for No. 2 plunger. The "SI" for this plunger should be exactly 60° after that for plunger No. 3. Again repeat the process by turning the pump to the "SI" for No. 4. It should be 60° after that for No. 2 plunger. When this has been adjusted, see how many degrees of rotation are required to reach the "SI" for plunger No. 1, and see if this coincides with the "SI" marks on the end plate of the pump and pump gear hub. The "SI" for No. 1 should be 60° after that for plunger No. 4. This will be a check on the accuracy of your work. If these marks do not coincide after 60° rotation from the "SI" for plunger No. 4, the entire process must be gone over again, starting off with cylinder No. 1, and corrections made wherever necessary.

With each plunger properly timed for start of injection, "SI", turn the camshaft until plunger No. 1 rises as far as the cam will lift it. Lift the tappets with a screw driver to see if there is at least .020" vertical free travel of the plunger before it strikes the delivery valve seat. For accurately checking this free travel from the maximum lift position, a short rod of small diameter can be slipped down into the delivery valve holder until it contacts the top of the plunger (delivery valve removed). A dial indicator contacting the top of the rod will show the exact clearance between the top of the plunger and the delivery valve seat when the tappet is raised from the maximum lift position. Check each plunger for this minimum clearance at the high point of lift of the camshaft.

Calibration of the Bosch Fuel Injection Pump

For calibration, the fuel piping for the pump should consist of a lead from a source of clean fuel to the forward fitting on the fuel supply pump. A pipe from the outlet fitting should include a 15-pound capacity pressure gauge and should read to the inlet fitting at the rear of the injection pump

REPAIR SECTION

FUEL SYSTEM - Continued

Calibration of the Bosch Fuel Injection Pump - Continued

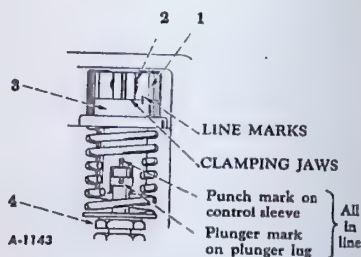
housing. A line for the return fuel should lead from the fitting at the front of the injection pump housing back to the original fuel supply container. The use of a filter in the outlet fuel line from the supply pump is recommended. Standard injection pipes and injection nozzles (set for 700 lbs.) are also necessary.

Run the pump to be sure that all air is bled out of the system. Bleed the air from the nozzles before making any quantity test. Attach a fixture to the pump and control rod and set the rod 6 mm. or 15/64" from the full stop position. Operate the pump for exactly four minutes at 550 R.P.M. The quantity of fuel delivered from each nozzle into the graduated beaker should be 150 cc. If this amount of fuel is not delivered from each nozzle, the following adjustments should be made:

- a. Move the control rod to the full stop position so that the clamping screw (2) *Illustr. 5*, in the jaw of the control segment is accessible.
- b. Loosen the clamping screw of the segment (1) for the plunger for which the quantity of fuel delivered was not correct.
- c. Facing the inspection cover opening, turn the control sleeve (3) to the right if fuel delivery was too low. Only a slight movement of the sleeve is required.
- d. If fuel delivery was too high, turn the control sleeve (3) to the left.
- e. Tighten each lock screw (2) that has been loosened.
- f. Take another test run of the pump with the control rod in exactly the same position as set for the initial test.

If the adjustment of the segments (1) was not satisfactory, repeat the foregoing steps until all are delivering the quantity required.

- g. The average delivery from the nozzles should be within 7.5 cc. of the amount specified. The maximum variation in the delivery of any nozzle from the average delivery for all nozzles should not exceed 6 cc.



Illustr. 5
Points of Adjustment for Timing and Calibrating Pump Plungers.

- (1) Toothed segment.
- (2) Clamping screw.
- (3) Control sleeve.
- (4) Tappet adjusting screw.

Move the control rod to a position 9 mm. or 23/64" from the full stop position. Repeat the test run outlined above. The quantity of fuel delivered from each nozzle should be 250 cc. If the control segments had to be readjusted to get the average fuel delivery from all nozzles within 12.5 cc. of the 250 cc. quantity, or within 10 cc. of one another, a re-run should be made at the 6 mm. or 15/64" setting of the control rod. The adjustment of the control segments should be balanced to give satisfactory fuel delivery at both the 6 mm. (15/64") and 9 mm. (23/64") setting of the control rod.

REPAIR SECTION

FUEL SYSTEM - Continued

Calibration of the Bosch Fuel Injection Pump - Continued

When pumps are tested prior to disassembly, and a pump cannot be made to deliver fuel within the limits specified, look for faulty delivery valve action, a faulty cam, and broken plunger springs, faulty test nozzles, or worn plungers. Switching of the test nozzles should not change the quantity of fuel delivered. If this does change the quantity of fuel delivered, the nozzles should be rechecked for uniform setting. If the pump delivers uniformly at these two settings, there is every assurance the engine will idle properly, and give smooth performance throughout the load range. This assumes the mechanical condition of the engine and the nozzles in the cylinder head are operating effectively.

Reassemble the governor to the pump. Operate the pump for exactly four minutes at 550 R.P.M. with the control lever held wide open. The quantity of fuel delivered should be 260 cc. The maximum variation from the average of fuel delivered from any one nozzle should be 10.4 cc. and the average quantity of fuel should be within 13 cc. of the 260 cc. specified. If this amount is not delivered, remove the cover for the operating lever stops and adjust the forward stop screw to obtain this amount. Turning the screw in decreases the fuel delivery. Be sure to lock the screw after adjusting. This will be as close as the horsepower of the engine and maximum idle speed of the engine can be set by bench testing of the fuel pump.

Whenever a governor has been reassembled and the setting of the stop plate (2), *Illust. 12*, is not known because new parts have been installed, it is necessary to operate the pump as closely as possible to the rated load speed or 600 R.P.M. of the pump. At this speed, the smoke limit cam (24), *Illust. 10*, should just float

against the rear corner of the step on the stop plate (2), *Illust. 12*. When set at the factory, the position of the parts is marked as indicated in *Illust. 12*. If the old parts are reinstalled, they can be made to line up with the scratch marks already inscribed. A straight edge against the forward step of the stop plate should show the alignment of the forward step of the stop plate with the scratch lines on the governor end cover. The scratch line on the smoke limit cam should line up with the mating mark on the fulcrum yoke lever. Where new parts are used, it may be necessary to reset both the cam and plate. If this is the case, eradicate the old scratch lines and add new lines at the new setting. Be sure the proper spring gap is used for the governor springs as outlined under the "Governor Reassembly". The setting of the stop plate and the smoke limit cam have a definite effect on engine performance which can be checked after assembly of the pump to the engine.

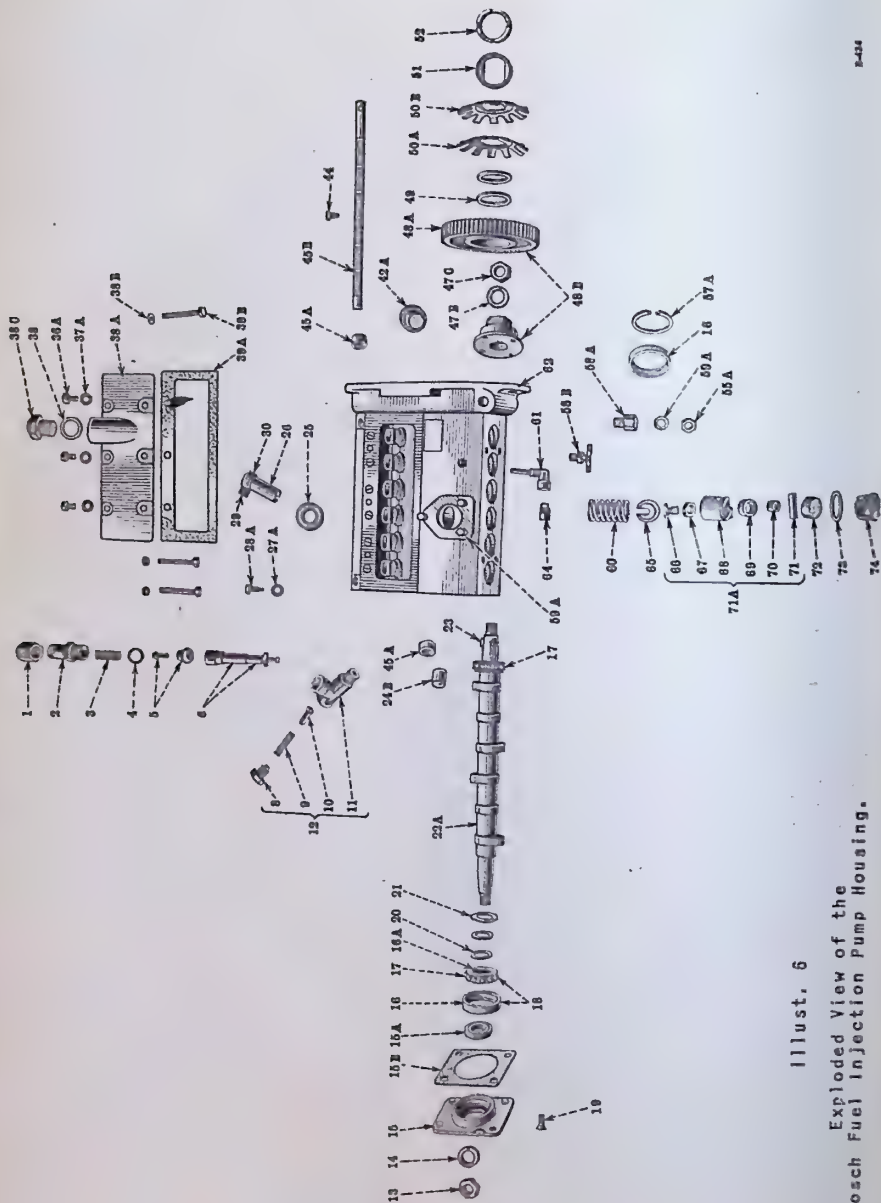
Before attaching the inspection covers to the pump, inscribe a line on both the control sleeve toothed segment and the control sleeve of the plunger so that their position at the time of calibrating can be duplicated, should it become necessary to disassemble the pump again. Check all lock screws and adjustments for tightness before replacing the inspection covers. Be sure the pump is filled with the proper grade and amount of lubricating oil before testing.

The injection pump can now be replaced on the engine and timed. If the high idle speed of the engine is not 1200 R.P.M., adjustment of the forward stop screw for the control lever will give the speed desired. Readjust the control mechanism as outlined in the "Starting System", Section 10. If the engine smokes excessively under load, check the timing for the best

(Continued on page 10.)

REPAIR SECTION

FUEL SYSTEM - Continued



Illustr. 6

Exploded View of the
Bosch Fuel Injection Pump Housing.

REPAIR SECTION

FUEL SYSTEM - Continued

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|---|----------|---|----------|--|
| 1 | Delivery valve holder protection cap. | 21 | Camshaft oil thrower. | | Adjusting spacer, .020". |
| 2 | Delivery valve holder. | 22A | Camshaft. | 49 | Adjusting spacer, .035". |
| 3 | Delivery valve spring. | 23 | Camshaft key. | | Adjusting spacer, .049". |
| 4 | Delivery valve holder gasket. | 24B | Control rod protection cover. | 50A | Adjusting spacer, .065". |
| 5 | Delivery valve and seat. | 25 | Plunger spring seat, upper. | | Drive gear spring disc, inner. |
| 6 | Plunger and barrel. | 26 | Control sleeve. | 50B | Drive gear spring disc, outer. |
| 8 | Valve screw. | 27A | Barrel set screw gasket. | 51A | Drive gear adjusting nut |
| 9 | Valve spring. | 28A | Barrel set screw. | | lock washer. |
| 10 | Valve proper. | 29 | Toothed segment clamping screw. | 52 | Gear adjusting nut. |
| 11 | Valve body. | 30 | Toothed segment. | 55A | Hex. nut, 1/4" N.C. |
| 12 | Overflow valve. | 36A | Inspection cover fastening screw, short. | 56A | Fuel supply pump housing lock washer. |
| 13 | Camshaft hex. nut. | 37A | Inspection cover fastening screw lock washer. | 57A | Bearing retainer ring. |
| 14 | Lock washer. | 38A | Inspection cover. | 58A | Lubricating oil drain plug. |
| 15 | End plate with oil seal. | 38B | Inspection cover fastening screw long gasket. | 58B | Lubricating oil level cock. |
| 15A | End plate oil seal. | | Inspection cover fastening screw, long. | 59A | Fuel supply pump stud. |
| 16 | Camshaft bearing, outer race. | 39A | Inspection cover fastening screw, long. | 60 | Plunger spring. |
| 16A | Camshaft bearing, inner race. | 39B | Pump housing baffle with button. | 61 | Lubricating oil overflow tube with plug. |
| 17 | Camshaft bearing retainer with balls. | 42A | Control rod securing screw. | 62 | Pump housing. |
| 18 | Camshaft bearing, L.H. and R.H. | 44 | Control rod bushing. | 65 | Plunger spring seat, lower |
| 19 | End plate fastening screw. Bearing adjusting washer, o. 1M/M. | 45A | Control rod. | 66 | Tappet screw. |
| | | 45B | Lock washer. | 67 | Tappet screw lock nut. |
| | | 47B | Drive gear hub nut. | 68 | Tappet shell with insert. |
| | | 47C | Drive gear. | 69 | Tappet roller bushing. |
| | | 48A | Drive gear hub and gear. | 70 | Tappet roller. |
| 20 | Bearing adjusting washer, o. 2M/M. | 48B | | 71 | Tappet pin. |
| | Bearing adjusting washer, o. 3M/M. | | | 71A | Tappet. |
| | | | | 72 | Felt cushion. |
| | | | | 74 | Closing plug gasket. |
| | | | | 75 | Closing plug. |

REPAIR SECTION

FUEL SYSTEM - Continued

Calibration of the Bosch Fuel Injection Pump - Continued

position. If it continues, and all other items of the system have been checked, the stop plate and the smoke limit cam may have to be readjusted. If the smoking condition of the engine is satisfactory, but apparently there is insufficient power for overload or lugging ability, a slight adjustment of the plate or cam may be necessary. The setting of the cam and plate can only be made accurately when the engine is tested with a dynamometer where it can be given the rated load and overload. Be sure to check all other possible parts of the engine and pump which might contribute to faulty operation, before attempting to set these parts.

Repair of the Bosch Fuel Injection Pump

If it ever becomes necessary to adjust or disassemble the fuel injection equipment, it is of utmost importance that cleanliness be practiced. Should any dust, grit, water, etc., reach the working parts of the injection pump, serious damage will result that may make costly shut-downs and repairs necessary. Only after its accessories have been washed thoroughly with clean Diesel fuel to eliminate entirely any dirt or dust, should disassembly of the equipment be attempted.

Repair of the injection pump is divided into three main units: The injection pump housing assembly; the supply pump assembly; the governor assembly.

With the complete injection pump removed from the engine, or while it is assembled to the engine, the fuel supply pump may be replaced after taking off the three nuts holding the unit to the studs (59-A), *Illust. 6*. Pull on the fuel supply pump housing (15-A), *Illust. 9*, to remove it. Be sure to use a good gasket (16) when replacing the fuel supply pump.

With the injection pump removed

from the engine as indicated in the procedure for this operation given in the Operations Section, the governor and pump housing assemblies can be separated. After removing the nine cap screws joining the governor and cover (38) *Illust. 10*, to the pump housing (62), *Illust. 6*, pull the cover to the rear until the dowels are free from the housing. Then slide the cover to the side to disengage the control rod linkage pin (27), *Illust. 10*, from the control rack (45-B), *Illust. 6*. Disassembly of each unit can now be performed independently of any other unit.

Disassembly of the Pump Housing Assembly

Remove the inspection cover (38-A), *Illust. 6*, the four barrel set screws (28-A) from the above inspection opening, the control rod securing screw (44) from the back side of the pump, the four closing plugs in the base of the pump, and the overflow valve (12). Wrench SE-1296 is made to fit the slot in these plugs. A similar tool can be made from a drag-link screw driver rounded to fit the 3/4" radius at the base of the slot.

Set the pump gear hub in a vise and remove the governor drive gear hub nut (47-C). Bend back lock (51) and remove the gear adjusting nut (52) (Service tool SE-1302). Lift off the lock, the two drive gear spring discs (50-A) and (50-B), the adjusting spacers (49), and the governor drive gear (48-A). Use puller SE-1303 to remove the gear hub (48-B) (with gear (48-A) in place) or turn the adjusting nut (52) on a few turns and pry the hub off, using a screw driver on each side under the nut while tapping on the end of the camshaft (22-A). Remove the key (23).

Remove the lubricating oil overflow tube with plug (61) from the base of the housing (62). Turn over the pump camshaft and place tappet holders (SE-1308), or their equivalent, between each tappet screw (66) and its lock nut (67).

REPAIR SECTION

FUEL SYSTEM - Continued

Disassembly of the Pump Housing Assembly - Continued

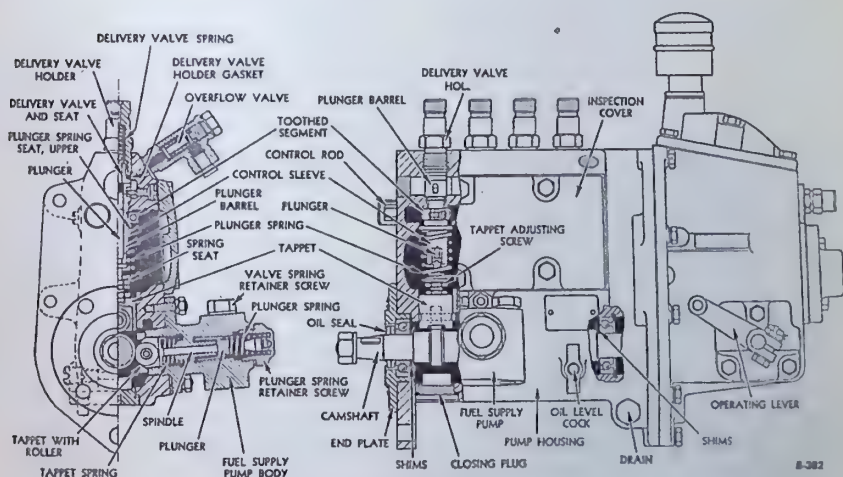
Remove the pump gear hub, the key in the camshaft, and then take off the end plate (15) with its oil seal (15-A), and the bearing outer race (16). The camshaft assembly can now be removed from the housing. Use a bearing race puller (SE-1300) to remove the bearing races (16-A) from the camshaft (22).

The complete tappets (71-A) can now be removed from the housing. The plunger (6), the lower spring seat (65), and the plunger spring (60) can all be removed through the holes in the base of the pump housing. The upper spring seat (25) and the control sleeve (26) with toothed segment (30) can now be removed through the inspection cover opening.

Remove the delivery valve holder (2) for the same plunger and lift out of the spring (3) and delivery valve (5). Use a block of wood and drive the plunger barrel (6) out of the housing with the delivery valve seat (5) and gasket (4). Flush the barrel and plunger with clean oil and slide the plunger within the barrel. Keep all the parts for this cylinder together before repeating the process for the other cylinders.

Repair of the Pump Housing Assembly

All parts should be carefully washed in clean Diesel fuel and blown dry with compressed air (free from water or dirt). Exceptionally dirty parts should be cleaned in paint remover. Gummed or sticky plungers should be soaked in acetone.



Illustr. 7
Cross Section of the Bosch Fuel Injection Pump.

REPAIR SECTION

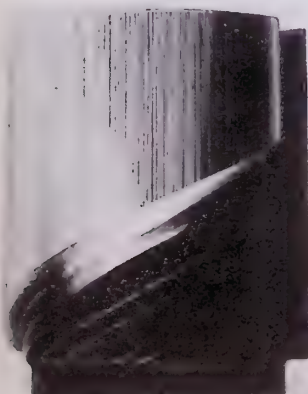
FUEL SYSTEM - Continued

Repair of the Pump Housing Assembly - Continued

If wear is excessive, the bushings (45-A), *Illust. 6*, may be replaced. They must be line-reamed to a dimension of .4331" to .4338". Clearance between the shaft should be from .0015" to .0027".

When replacing the outer bearing race (16), replace also the inner bearing race (16-A) and bearing (17). The end play of the camshaft (22) when assembled complete is .004" to .008". The lip of the oil seal (15-A) faces the interior of the pump housing (62).

The plunger and barrel (6) should be carefully inspected for wear. If the plunger has lost its mirror-like appearance and looks dull or grey, it is a sure indication that the plunger has been worn due to dirt in the fuel. The edge of the plunger helix should appear sharp under a magnifying glass and the plunger should not be nicked or scratched. The upper portion of a badly worn plunger is magnified many times in *Illust. 8*. If there



Illust. 8
Picture of a Badly
Worn Plunger.

is some doubt as to whether it is necessary to replace the plunger, assemble the pump and test it as outlined under the "Basic Tests and Adjustments" heading. Wipe the plunger only with cleansing tissue, never handle the polished surface with bare fingers.

Always use a new delivery valve gasket (4) *Illust. 6*. The delivery valve (5) should fall freely in its seat with both parts lubricated.

The toothed segment (30) should never be moved on the control sleeve (26) unless either are to be replaced. The scratch mark on both parts should line up. If the guide slots are badly worn, replace the sleeve. When assembling new parts, line up the gap in the segment with the slots in the segment for initial setting. Change the setting as explained under "Basic Tests and Adjustments".

Reassembly of the Pump Housing Assembly

When reassembling plunger units in the pump housing, complete all the operations for any one cylinder before proceeding to the next. It is absolutely essential that each plunger (6) *Illust. 6*, is replaced in the barrel from which it is removed. Lubricate the plunger before inserting in the barrel.

Separate the plunger and barrel (6). Insert the barrel in the pump with the long slot in the top of the barrel facing the inspection cover side of the pump. Screw in the barrel set screw (28-A) with its gasket (27-A). Assemble the delivery valve and seat (5), followed by gasket (4), spring (3), and delivery valve holder (2). Tighten the delivery valve holder to 35 ft.-lbs. torque. Place a cap (1) over the holder.

Replace the control rod (45-B) and turn in its securing screw (44) with the long end to the rear. Insert the control sleeve (26) and toothed segment (30) through the inspection cover opening and slide

REPAIR SECTION

FUEL SYSTEM - Continued

Reassembly of the Pump

Housing Assembly - Continued

the unit over the end of the plunger barrel. Move the control rod to a point where the spot on the round surface near the rear of the rod is flush with the inside surface of the housing. Raise the control sleeve (26) and segment (30) to engage the teeth on the control rod so that the split in the segment (30) faces directly out, perpendicular to the control rod. Slide the upper plunger spring seat in place with the groove toward the spring.

Insert the plunger spring over the sleeve from the bottom. Dip plunger (6) in clean Diesel fuel and use service tool SE-1298 or its equivalent to gently insert the plunger (6) in its barrel. Be sure the flange on the plunger with the punch mark freely enters the slot of the sleeve (26) which has a similar mark, *Illust. 5*. Withdraw the plunger slightly and attach the lower plunger spring seat. Be sure the recess in the seat is toward the bottom. Assemble the tappet (71-A), *Illust. 6*, and insert it into the bore in the pump housing. The pin (71) engages a slot in the housing and prevents the tappet from turning. Push the tappet toward the top of the pump housing, engage the flange on the plunger in the control sleeve slot, and slip the tappet lifter SE-1308 between the tappet screw (66) and its lock nut. Move the control rack back and forth to check the free movement of the parts.

Repeat the foregoing process to replace all assemblies for each cylinder. Check after each installation for freedom of parts. Remove any assembly that causes difficulty before proceeding further.

Replace the rear bearing race (16) in the pump housing. (62). Also replace the forward bearing race (16) in the end plate (15) after the oil seal (15-A) is in place

with the lip facing the bearing. Assemble the camshaft to the housing and fasten to end plate. Check the end play of the camshaft. Arrange shims (20) for end clearance of .004" to .008", preferably .004". Tappet holders can now be removed. Follow the procedure outlined under "Basic Tests and Adjustments".

Replace key (23). Set the drive gear hub (48-B) in the gear (48-A) and assemble both to the camshaft. Tighten nut (47-C). Assemble adjusting spacers (49), spring discs (50-A) and (50-B), lock washer (51), and gear adjusting nut (52). The spacers (49) are furnished in various thicknesses, namely .035", .049", .065". Use one or more spacers, as required, so that 3 to 3-1/4 ft.-lbs. torque are required to turn the gear (48-A) when the nut (52) is drawn tight. Lock the lock washers (51) against the nut (52).

If only the pump housing has been repaired, assembly of the supply pump and governor can be completed, the pump set for approximately full load delivery as outlined under the "Calibration" heading, and the unit reassembled to the engine. Retime for best operation as outlined in the Operations Section.

Disassembly of the Supply Pump

Remove the valve spring retaining screws (10), *Illust. 9*, with gasket (9), and lift out springs (8) and valves (7). Keep these parts in order so they can be replaced in their original position.

Take off the plunger spring retainer screw (11) with gasket (12), and lift out spring (13) and plunger (14). Remove from the housing (15-A) the tappet-securing pin (1), and slide out the tappet assembly (1), (2), (3), and (4). Spring (5) and spindle (6) can then be removed.

Removing the tappet waist pin (2) from the tappet shell (4) releases the tappet roller (3).

REPAIR SECTION

FUEL SYSTEM - Continued

Repair of the Supply Pump

Flush all parts with clean Diesel fuel. Examine all valve seats and the ends of the valves. If the ends of the valves are not smooth they may be refinished in a speed lathe. The spindle (6) is a lapped fit in the housing (15-A); replace the spindle if it is worn excessively.

Reassembly of the Supply Pump

Reassembly of the supply pump is the reverse of the disassembly procedure.

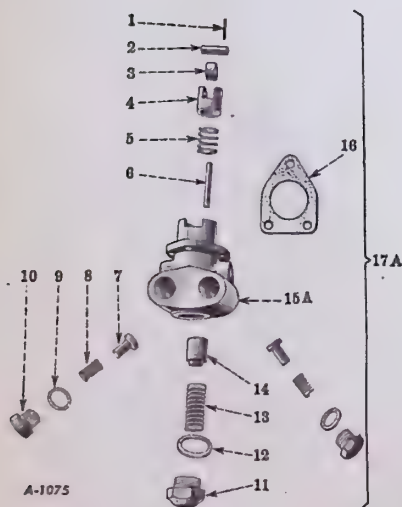
Be sure all parts are clean before proceeding. If the supply pump will not prime after reinstalling it, remove the inlet screw (10), put in a few drops of lubricating oil, and replace the screw. With the overflow valve on the pump functioning properly, the supply

pump should maintain 6 to 8 lbs. of fuel pressure in the pump housing sump. The free length of the overflow valve spring (9), *Illust. 6*, is 5/8".

Disassembly and Repair of the Governor

Remove the governor inspection cover (53), *Illust. 10*. Take off the upper and lower operating stop covers (88) and (89). Take out the four spring cap screws and remove the retainer end cup (65). After turning off the bearing nut (37), the bearing (35) outer and inner governor spring spacers (79) to (84), the outer and inner governor springs (33) and (32) can then be slipped out. Removing the cap screws (15) from the bearing support plate (10) permits the governor weight and shaft assembly (18), complete to be pulled from the end cover (38). The sleeve (19) with the bushing and thrust bearing can now be slipped from the pegs of the fulcrum lever (20) for removal.

(Continued on page 15.)



Illust. 9
Exploded View of the
Fuel Supply Pump.

| Ref. No. | Description |
|----------|---------------------------------------|
| 1 | Tappet securing pin. |
| 2 | Tappet wrist pin. |
| 3 | Tappet roller. |
| 4 | Tappet shell. |
| 5 | Tappet spring. |
| 6 | Spindle. |
| 7 | Valve, inlet and outlet. |
| 8 | Valve spring. |
| 9 | Valve spring retainer screw gasket. |
| 10 | Valve spring retainer screw. |
| 11 | Plunger spring retainer screw. |
| 12 | Plunger spring retainer screw gasket. |
| 13 | Plunger spring. |
| 14 | Plunger. |
| 15A | Fuel supply pump housing. |
| 16 | Fuel supply pump housing gasket. |
| 17A | Fuel supply pump, complete. |

REPAIR SECTION

FUEL SYSTEM - Continued

Disassembly and Repair of the Governor - Continued

If there is excessive play between the fulcrum lever assembly (20) and the bracket pin (77), or between the fulcrum lever bracket (75) and the operating shaft (74), these parts may be removed after taking out the spring plate set screw (73) and pulling the operating shaft (74) from the end cover (38). A socket wrench with an opening $\frac{3}{16}$ " across the flats is necessary. The ends of the spring on the plate (78) should contact both sides of the prong. The control rod link (28) can be removed from the control rod link pin (31) if there is excessive play between the pin and the fulcrum lever assembly (20). Do not remove the cam (24) unless it must be replaced. Be sure the nut is tight on the square head bolt (23). Do not remove the stop plate bridge (55) and the stop plate (56) unless they must be replaced.

The governor weight and shaft assembly (20) may be disassembled if necessary. Unless the bearing or shaft is in need of replacement, there is no cause to separate these parts. If the weights (5) have excessive play on the governor weight pins (3), the cotter keys (1) and washers (2) can be removed, and the pins (3) driven from the governor spider. Do not drive on the drilled end of the pin. The bushings (4) in the weights can be replaced and line-reamed to size. Both bushings are not reamed to the same size. The bushing with the large bore is on the same side of the governor weight as the long arm which extends from the weight to operate the governor sleeve (19). This bushing is reamed to .3700" to .3705" for the .3680" to .3685" end of the pins (3). The small diameter bushing is reamed to .3545" to .3550" for the .3525" to .3530" end of the pins (3). The governor weight shaft (14) is ground to .385" to .390" while the bushing in the sleeve (19) is finished to .3750" to .3756".

The governor weight pins are hol-

low from the large end almost to the small diameter end. Holes are drilled in the pins (3) meet this long hole. The grooves at these holes distribute the oil to the bushings in the governor weights. The governor weight shaft (14) is drilled from the gear end back to the area of travel of the sleeve (19). The spider (6) is also drilled to meet a hole in the shaft. The baffle, *Illust. 6*, is so situated that it collects oil thrown from the gears. The center of the baffle contacts the spring-loaded governor shaft plunger oiler (12) and (13), *Illust. 10*. Oil flows from the reservoir, through the plunger, and inside the shaft from where it is distributed to the sleeve (19) and to the governor weights through drilled holes in the shaft, the spider (6) and the pins (3).

If wear is excessive, the bushings (94) may be removed from the end cover (38). After pressing replacement bushings in place, line-ream them to .377" to .378".

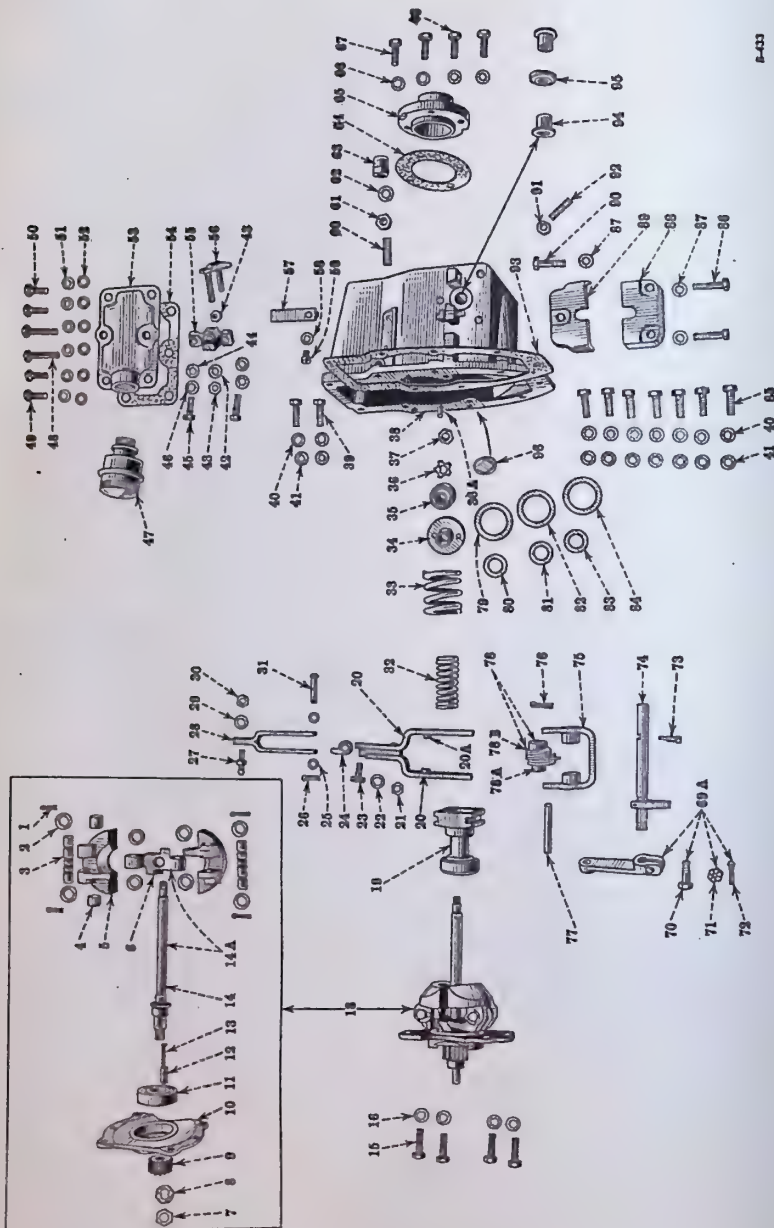
Reassembly of the Governor

If new bushings have been assembled to the weights and properly line-reamed to size, hold the weight (5), *Illust. 10*, in place and press the pin (3) into the spider (6), being sure the small end of the pin enters from the large bore bushing side of the weight. Cotter key holes should be equal distance from the weight on both sides. Replace washers (2) and cotter keys (1). The head of the cotter key is normally on the inside. Bend both ends of the key back around the pin. If bearing (11) has been removed from the shaft (14), press the bearing into the bearing support plate (10) and then assemble the unit to the shaft. Push the driven gear on the end of the shaft and lock the nut after tightening. Bend the lock over, all the way around the nut. Replace the governor shaft plunger oiler (12) and the spring (16) after blowing air through holes in the shaft.

(Continued on page 19.)

REPAIR SECTION

FUEL SYSTEM - Continued



Illustr. 10
Exploded View of the Governor.

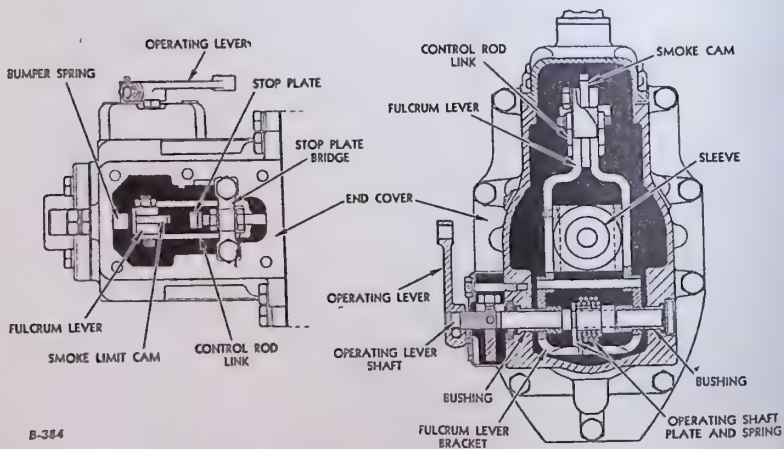
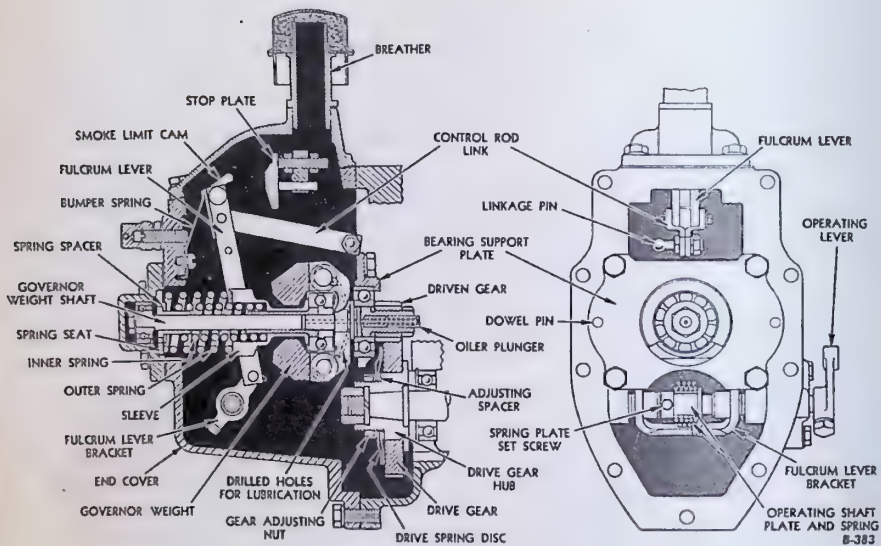
REPAIR SECTION

Fuel System - 7
Page 17

FUEL SYSTEM - Continued

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|--|----------|---|----------|---|
| 1 | Cotter pin. | 32 | Governor spring, inner. | 64 | Spring retainer end cap gasket. |
| 2 | Governor weight washer. | 33 | Governor spring, outer. | 65 | Spring retainer end cap. |
| 3 | Governor weight pin. | 34 | Spring seat. | 66 | Spring retainer end cap bolt lock washer. |
| 4 | Governor weight bushing. | 35 | Governor weight shaft bearing (spring end). | 67 | Spring retainer end cap bolt, upper. |
| 5 | Governor weight. | 36 | Governor weight shaft bearing lock washer. | 68 | Spring retainer end cap bolt, lower. |
| 6 | Governor spider with pins. | 37 | Governor weight shaft bearing nut. | 69A | Operating lever. |
| 7 | Governor driven gear nut. | 38 | Governor end cover. | 70 | Operating lever bolt. |
| 8 | Governor driven gear lock washer. | 39A | Bearing support plate with dowels. | 71 | Operating lever bolt nut. |
| 9 | Governor driven gear. | 39 | Governor end cover bolt. | 72 | Cotter pin. |
| 10 | Bearing support plate with dowels. | 40 | Governor end cover bolt lock washer. | 73 | Spring plate set screw. |
| 11 | Governor weight shaft bearing (drive end). | 41 | Governor end cover bolt washer. | 74 | Operating lever shaft. |
| 12 | Governor shaft plunger oiler. | 42 | Stop plate screw washer. | 75 | Fulcrum lever bracket. |
| 13 | Governor shaft plunger oiler spring. | 43 | Hex. jam nut. | 76 | Cotter pin. |
| 14 | Governor weight shaft. | 44 | Stop plate bridge bolt washer. | 77 | Fulcrum lever bracket pin. |
| 14A | Spring retainer end cap gasket. | 45 | Stop plate bridge bolt. | 78 | Operating shaft plate. |
| 15 | Governor weight shaft and spider. | 46 | Stop plate bridge lock washer. | 79 | Outer spring spacer, .020". |
| 16 | Bearing support plate bolt. | 47 | Breather. | 80 | Inner spring spacer, .020". |
| 18 | Bearing support plate bolt lock washer. | 48 | Governor inspection cover bolt, center. | 81 | Inner spring spacer, .042". |
| 19 | Sleeve with bushing and thrust bearing. | 49 | Governor inspection cover bolt. | 82 | Outer spring spacer, .042". |
| 20 | Fulcrum lever. | 50 | Governor inspection cover bolt, short. | 83 | Inner spring spacer, .058". |
| 20A | Fulcrum lever pivot pin. | 51 | Governor inspection cover bolt lock washer. | 84 | Inner spring spacer, .058". |
| 21 | Hex. jam nut. | 52 | Governor inspection cover bolt washer. | 85 | Outer spring spacer, .058". |
| 22 | Smoke limit cam screw lock washer. | 53 | Governor inspection cover with baffle. | 86 | Outer spring spacer, .083". |
| 23 | Smoke limit cam screw (fulcrum lever). | 54 | Governor end cover gasket. | 87 | Governor end cover bolt, long. |
| 24 | Smoke limit cam. | 55 | Stop plate bridge. | 88 | Operating lever stop cover lower. |
| 25 | Control rod link pin washer. | 56 | Stop plate (end cover housing). | 89 | Operating lever stop cover, upper. |
| 26 | Cotter pin. | 57 | Bumper spring. | 90 | Operating lever stop cover upper bolt. |
| 27 | Control rod linkage pin. | 58 | Bumper spring lock washer. | 91 | Hex nut. |
| 28 | Control rod link. | 59 | Screw. | 92 | Set screw. |
| 29 | Control rod linkage pin lock washer. | 60 | Bumper spring adjusting screw. | 93 | Governor end cover gasket. |
| 30 | Hex. nut. | 61 | Hex nut. | 94 | Operating lever shaft bushing. |
| 31 | Control rod link pin. | 62 | Bumper spring cap gasket. | 95 | Operating lever shaft oil seal. |
| | | 63 | Bumper spring cap. | | |

FUEL SYSTEM - Continued



Illust. 11
Cross Section of the Governor.

REPAIR SECTION

FUEL SYSTEM - Continued

Reassembly of the Governor
- Continued

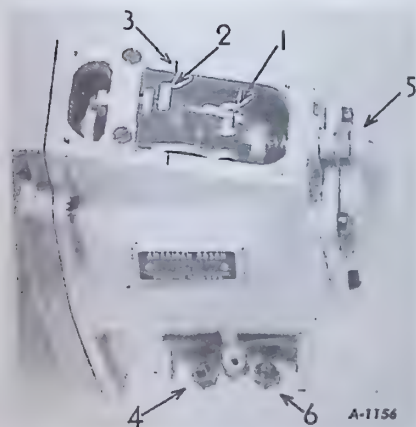
Assemble the fulcrum lever (20) to the fulcrum lever bracket with pin (77). Bend both ends of the cotter keys (76). Attach the control rod link (28) to the fulcrum lever, with the linkage pin (27) on the smoke limit (24) cam side of the fulcrum lever. Set the assembly in the end cover (38), slide the operating lever shaft (74) in place, hold the shaft plate with spring (78) in place, and push the shaft in as far as it will go. The spring end of the plate (78) faces the control lever side. Be sure to engage the prongs of the spring over the bracket (75). Locate the set screw (73) in the tapped hole in the plate (78) and in the hole in the shaft (74). Use a 3/16" socket wrench to tighten the set screw.

Engage the slots of sleeve (19) in the pins of the fulcrum lever (20). Then slide the governor shaft assembly (18) into place. Locate the bearing support plate (10) over the dowel pins in the end cover

(38). Be sure the cut-out side of the bearing plate is on the bottom, and that the cap screws with lock washers are all drawn tight.

Where original parts of the governor are being reassembled, put the inner and outer governor springs (32) and (33) in place. Set the inner and outer springs spacers (79) to (84) on the spring seat (34) and slip the spring seat over the shaft. Slide bearing (35), with the projecting side against the shoulder, on shaft (18). Tighten nut (37) with lock (36) in place, bend the lock, and replace the end cup (65) with the gasket (64).

Where new springs or parts are included in the governor assembly, replace the outer spring and move the control lever (69-A) toward the front of the pump all the way. The end of the spring should extend 1/16" outside the end of the end cover (38). If the spring does not extend slightly, measure the distance from the outer spring seat in the sleeve (19) to the out-



- (1) Scratch line on smoke limit cam and fulcrum lever.
- (2) Stop plate.
- (3) Scratch line on end cover to line up stop plate.
- (4) High idle speed stop screw.
- (5) Bumper spring adjuster.
- (6) Pump shut-off stop screw.

Illust. 12
Top View of Governor with
the Inspection Covers Removed.

REPAIR SECTION

FUEL SYSTEM - Continued

Reassembly of the Governor - Continued

side of the end cover (38) where the end cup attaches. Measure the length of the outer spring. Add spring spacers of .020", .042", .058", or .083" thickness, or a combination of these spacers, to make the distance measured up to 1/16" but not more than 1/16" longer than the length of the spring. The counterbore in the sleeve (19) for the inner spring (32) is much deeper than that for the outer spring (33).

With the proper outer spacer, if any, and the inner spring in place, hold the spring seat lightly against the outer spring, being sure the entire assembly is as far forward as it will go. With a depth gage, measure the distance from the end of the inner spring

to the outer surface of the spring seat. Holes in the spring seat are provided to make this measurement. Try several positions of the spring seat. Subtract .125" from this dimension to allow for the thickness of the spring seat. Inner spacers of necessary thickness should be used to reduce the measurement to .177" (4.5 mm.) or the required spring gap. Put the springs in place in the governor, place the spacers required on the spring seat (34), slide the seat on the shaft (18), and complete the assembly as outlined in the foregoing paragraph.

After reassembly is completed, clean with Diesel fuel. Dry off any excess oil with clean, dry air. Attach the unit to the pump housing and test as outlined under the heading, "Basic Tests and Adjustments".

REPAIR SECTION

POWER TAKE-OFF

Front Power Take-Off

After taking the driven member from the end of the front power take-off shaft, remove the six 3/8-inch hex. nuts from the studs (4), *Illust. 1* in the fan drive pulley (3). Lift off the nut locks (11), felt washer retainers (10), felt washer (9), shaft retainers (8) and pull out the front power take-off shaft. The coupling (7) can be slid from the studs on the fan drive pulley (3).

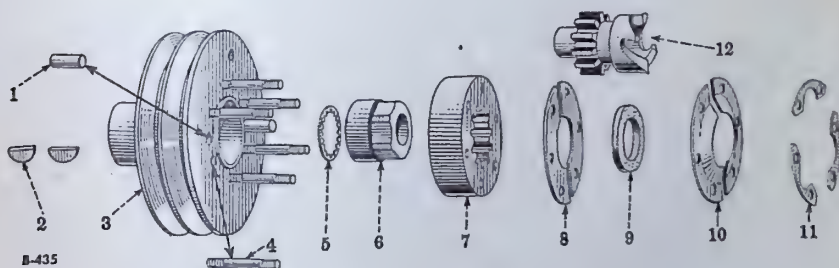
Reassembly of this unit is the reverse of the removal procedure.

When the complete radiator is removed from a tractor equipped with the front power take-off, the replacement procedure necessitates special steps so that the lower radiator water tank will be aligned with the engine crankshaft and the front finished face will be square

with the center line of the crankshaft.

After the radiator is replaced, loosen the bolts holding the lower radiator water tank to the main frame side channels. Bolt an alignment gage coupling similar to that sketched in *Illust. 2* to the front power take-off coupling. Screw the alignment gage coupling shaft into the coupling. Slip the alignment gage bearing on the shaft and insert it into the bore of the radiator tank. The gage bearing should enter readily, and the outer flange should fit all around against the machined face of the water tank. Use a feeler gage for this purpose.

If necessary, slightly slot the bolt holes in the main frame side channels to facilitate alignment. When alignment is perfect, tighten bolts in the water tank and side channels.

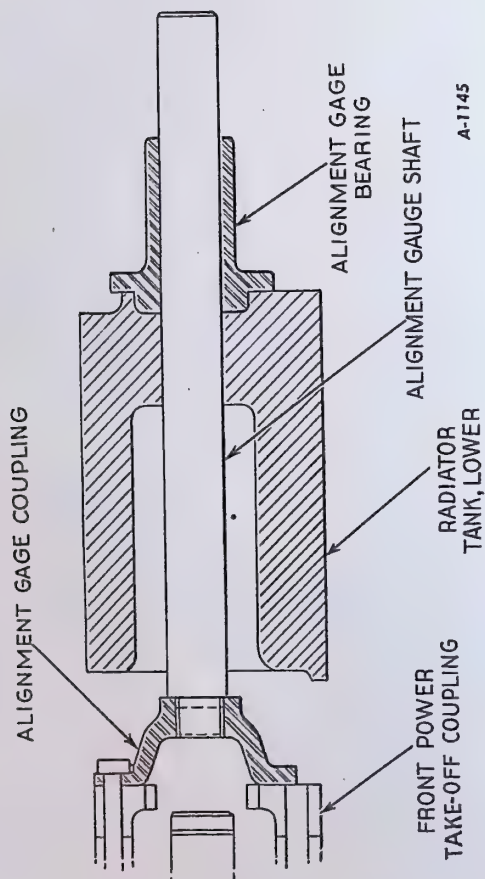


Illust. 1
Exploded View of Front Power Take-Off Coupling Assembly.

| Ref. No. | Description | Ref. No. | Description |
|----------|-------------------------|----------|-------------------------|
| 1 | Pin. | 7 | Coupling (11 teeth). |
| 2 | Key (No. 23 Woodruff). | 8 | Shaft retainer. |
| 3 | Pulley with drive pins. | 9 | Felt washer. |
| 4 | Stud. | 10 | Felt retainer. |
| 5 | Lock washer. | 11 | Lock. |
| 6 | Nut. | 12 | Starting crank adapter. |

REPAIR SECTION

POWER TAKE-OFF - Continued Front Power Take-off Coupling



Illustr. 2
Cross-Section of Gauge to be Used for Checking Alignment
of Lower Radiator Water Tank with Respect to the Crankshaft.

REPAIR SECTION

POWER TAKE-OFF - Continued

Front Power Take-off - Continued

In order to eliminate the necessity for going through the aligning procedure on future removals of the radiator, two 1/2 inch dowels may be assembled to the side of the tank by drilling two 15/32 inch holes through the main frame side channels and into the water tank when alignment is secured and both parts are tightly bolted together. Finish-ream the holes to .497 inch. Space the holes conveniently near the bolts to avoid interference, and use 1-1/8 inch to 1-3/8 inch length dowels.

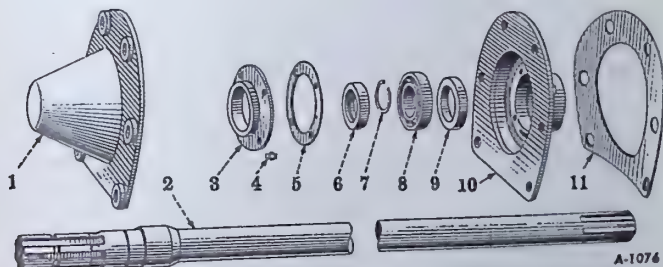
transmission drive gear. When not in use, the rear end of the shaft can be enclosed with the cover (1), *Illust. 3.*

To remove the shaft with its attached parts, take out capscrews holding bearing cage (10) to the main frame and use puller capscrews to withdraw the entire unit. After taking the capscrews out of the bearing retainer (5), the retainer with oil seal (6) and gasket (5) can be removed from the shaft. Taking the snap ring (7) from the shaft (2) allows the shaft to be pulled from the bearing cage (10). The bearing (8) and the oil seal (9) can now be removed from the bearing cage (10). The leather lip of oil seal (9) faces the drive bevel gears. The lip of seal (6) faces the bearing (8).

Reassembly and replacement is the reverse of the above. Be sure to use new gaskets (5) and (11).

Rear Power Take-off

The rear power take-off consists of a shaft mounted in the rear of the main frame which passes inside the upper spline shaft of the transmission and is driven from the



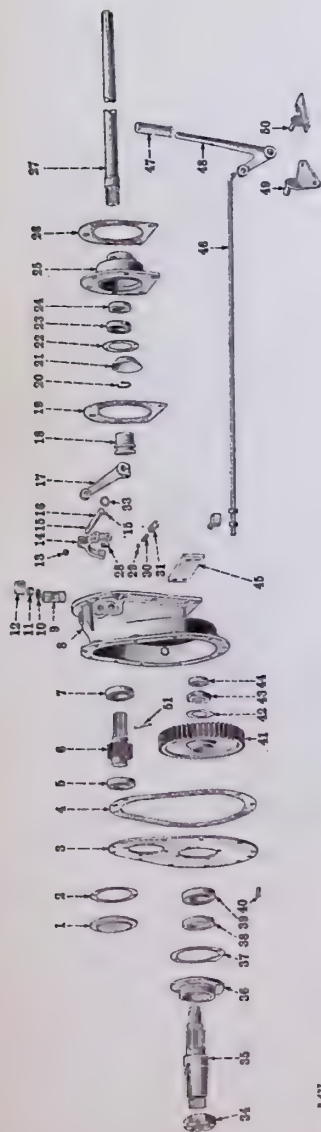
Illust. 3
Exploded View of the Rear Power Take-Off.

| Ref. No. | Description | Ref. No. | Description |
|----------|---------------------|----------|------------------|
| 1 | Cover. | 7 | Snap ring. |
| 2 | Shaft. | 8 | Bearing. |
| 3 | Retainer with seal. | 9 | Oil seal, inner. |
| 4 | Lubricator. | 10 | Cage with seal. |
| 5 | Gasket. | 11 | Gasket. |
| 6 | Oil seal, outer. | | |

REPAIR SECTION

POWER TAKE-OFF - Continued

Reduced Speed Rear Power Take-off



Illustr. 4

Exploded View of the Reduced Speed Power Take-Off.

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|-----------------------------|----------|---|----------|--------------------------------|
| 1 | Pinion bearing cage. | 19 | Housing gasket. | 35 | Gear shaft. |
| 2 | Pinion bearing cage gasket. | 20 | Power shaft bearing retainer snap ring. | 36 | Gear shaft outer bearing cage. |
| 3 | Housing cover. | 21 | Power shaft oil slinger. | 37 | Cage gasket. |
| 4 | Housing cover gasket. | 22 | Power shaft bearing retainer. | 38 | Oil seal. |
| 5 | Pinion bearing. | 23 | Power shaft bearing. | 39 | Gear shaft bearing, outer. |
| 6 | Pinion. | 24 | Power shaft oil seal. | 40 | Housing cover dowel pin. |
| 7 | Pinion bearing. | 25 | Power shaft bearing cage. | 41 | Gear. |
| 8 | Housing, complete. | 26 | Power shaft bearing cage gasket. | 42 | Gear clamp nut lock. |
| 9 | Breather pipe. | 27 | Power shaft. | 43 | Gear clamp nut. |
| 10 | Breather screen. | 28 | Shifter pin. | 44 | Gear shaft bearing, inner. |
| 11 | Breather felt. | 29 | Shifter poppet. | 45 | Housing spacer. |
| 12 | One pipe cap (1"). | 30 | Shifter poppet spring. | 46 | Shifter rod. |
| 14 | Shifter fork. | 31 | Shifter poppet bushing. | 47 | Shifter hand lever handle. |
| 15 | Shifter shaft key. | 32 | Shifter shaft key. | 48 | Shifter hand lever, complete. |
| 16 | Shifter shaft. | 33 | Gear shaft nut. | 49 | Shifter hand lever bracket. |
| 17 | Shifter lever. | 34 | Shifter coupling. | 50 | Shifter hand lever bracket. |
| 18 | Shifter coupling. | | | 51 | Shifter coupling stop pin. |

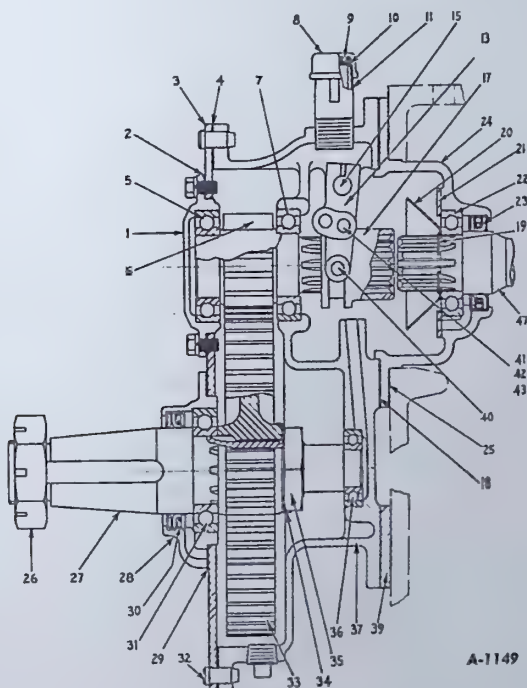
REPAIR SECTION

POWER TAKE-OFF - Continued

Reduced Speed Rear Power Take-off - Continued

The reduced speed rear power take-off attaches to the rear of the main frame. A long shaft of the unit extends forward, passes inside the upper spline shaft, and is driven by a spline within the transmission drive gear. The speed reduction portion of the assembly is contained within the housing (8), *Illust. 4*, which can be removed by disconnecting shifter rod (46) from shifter lever (17), shifting the

lever (17) to the engaged position, removing capscrews holding the housing (8) to the main frame, and lifting spacer (45) from between the two castings. This assumes that all parts attached to the gear shaft (35) and not shown in *Illust. 4* which might interfere with the removal of the unit, are removed prior to proceeding as outlined. The power shaft unit, including items (19) to (27), can be removed by applying puller capscrews to the tapped holes provided in the bearing cage (25).



A-1149

Illust. 5
Cross-Section of the Reduced Speed Power Take-Off.

REPAIR SECTION

POWER TAKE-OFF - Continued

Reduced Speed Rear Power Take-off - Continued

The power shaft (27) and the oil slinger (21) can be removed from the power shaft unit after the snap ring (20) is removed. Taking out the capscrews in the bearing retainer (22) allows the bearing (23) and the oil seal (24) to be removed from the bearing cage (25). The lip of the leather oil seal faces the drive bevel gear compartment.

The disassembly of the parts in the housing (8) starts with the removal of the pinion bearing cage (1). The bearing (5) may or may not come out with the bearing cage (1). (Also refer to *Illust. 5*.) Take out the capscrews and the dowel pins (40) in the housing cover (3). Remove the cover, taking with it the gear shaft (35) and the gear (41). The bearing (44) may or may not come out with the shaft.

Now the pinion (6) with the bearings (5) and (7) can be pulled from the housing. The shifter coupling (18) will then drop out. To remove the shifter fork (14) assembly, lift out the shifter pins (28), remove the shifter poppet bushing (31), poppet spring (30), and poppet (29). Take out the screw in the shifter fork (14), and pull the shifter shaft (16) out of the housing (8) with the shifter lever (17).

To disassemble the gear shaft (35), pull the bearing (44) from the shaft, and remove the nut (43) with lock washer (42). The gear (41) can then be pulled from the shaft. Removing the bolts in the bearing cage (36) allows the shaft (35),

the bearing cage (36), gasket (37), oil seal (38), and bearing (39) be pulled from the housing cover (3). Pulling the bearing cage from the shaft allows the oil seal to be replaced. The lip of the leather oil seal faces the inside of the housing.

Reassembly of the unit is the reverse of the disassembly procedure. When replacing the shifter fork (14), be sure there is equal clearance between shifter pins (28) and the shifter coupling (18). Do not turn the shifter poppet bushing (31) in too far, or it will strike against the shifter fork.

Belt Pulley

The belt pulley attaches to the main frame over the end of the power take-off. After removing the mounting bolts from the carrier (28), *Illust. 6*, the entire unit can be slid from the end of the power take-off shaft.

Disassembly of the Belt Pulley

The pulley (3) can be pulled off after taking out two 1/2" capscrews and bending back the capscrew lock (1) between capscrews and the retainer washer (2). Items (4) to (22) and (35) to (45), inclusive, can be removed as a unit after taking out eight 5/8" capscrews holding the gear box (18) to the carrier (28). The shims (20), (21), and (22) are used to set the gears properly for tooth contact.

REPAIR SECTION

POWER TAKE-OFF - Continued**Disassembly of the
Belt Pulley - Continued**

With the pulley removed, the shaft (11) can be taken out. Remove the capscrews from the bearing cap (45) and the bearing retainer washer (42). Tapped holes are provided in the bearing cage (40) for puller capscrews. The oil seal cage (5) can be removed and the assembly forced out from that side. The gear (35) and spacer (36) can then be lifted from the gear box (18).

The oil seal (8) and felt washer (7) can be taken out of the oil seal cage (5) if their replacement is desirable. The bearing (10) can be pressed from the shaft (11). The shims (37), (38), and (39) are of varying thickness and are used to obtain the proper running clearance or backlash between the gears. Two capscrews in the bearing retainer washer (43) hold the bearing (41) on the shaft (11).

The shifter coupling (58) can be removed by disengaging it from the coupling (55). The shaft (53) can be removed from the carrier (28) after taking the capscrews from the bearing retainer washer (56) and from the bearing retainer (26). Slide the pulley coupling (55) off the forward end of the shaft and push the pinion (25) with bearing (41) out of the rear end of the carrier (28). The bearing (54) can then be removed from the carrier.

The shifter mechanism can be removed after taking the capscrews from the shifter fork (49) and pulling on the shifter lever (50). When the round keys (47) clear the shifter fork, they may be lifted out and the shaft (48) withdrawn from the carrier. The poppet ball (31), poppet spring (32), and the fork (49) can all be taken out of the carrier.

The power take-off can be disassembled after taking off the retainer (60) and the snap ring (7), *Illust. 3*, from the shaft assembly (2).

Reassembly of the Belt Pulley

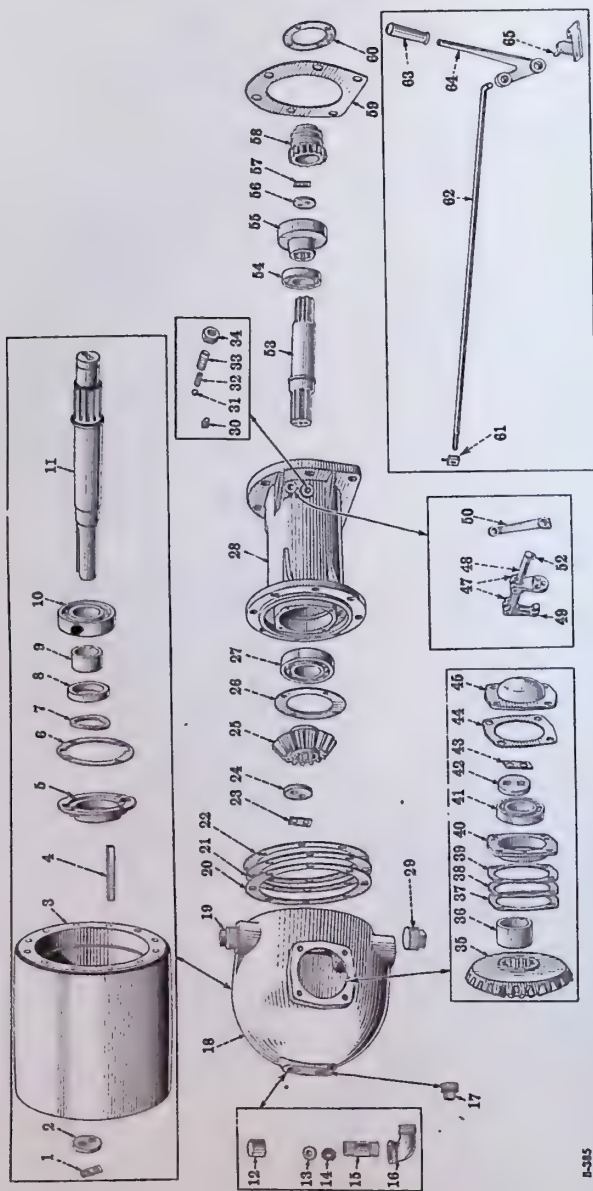
Reassembly of the units is practically the reverse of the disassembly procedure. Assemble the carrier unit and the gear box units separately. The carrier assembly can be completed by pressing bearings (27) and (54), *Illust. 6*, on the shaft (53). Put the bearing retainer (26) in position with capscrews in the retainer. Attach the pinion (25) and bolt it secure with retainer washer (24) in place. Assemble the shaft unit to the carrier and bolt the bearing retainer (26) to the carrier (28). Then attach the coupling (55) and the bolt or retainer (56).

Place the pulley shaft (11) in the gear box (18). Set the gear (35) over splines of the shaft. Slide on the spacer (36) and press the bearing cage (40) with the bearing (41) into the shaft, using the same number of shims (37), (38), and (39) as were removed. Attach the bearing retainer washer (42) and bolt in place. Then press the bearing cage into the gear box (18). Press the bearing (10) on the shaft (11) and press into position in the gear box. Add the oil seal cage (5) with spacer (9), oil seal (8), felt washer (7), and gasket (6).

Connect the gear box to the carrier with the shims (20), (21), and (22) in place. Test gears for the proper backlash. The heels of the gears should be flush as observed through the opening in the top of the gear box when lighted through the other holes in the gear box. The backlash of the gears should be .004 inch to .008 inch. Rearrange the shims (37), (38), and (39) to obtain this backlash. Reassemble the rest of the parts in the reverse of the disassembly procedure.

REPAIR SECTION

Belt Pulley - Continued



Exploded View of the Belt Pulley Assembly.

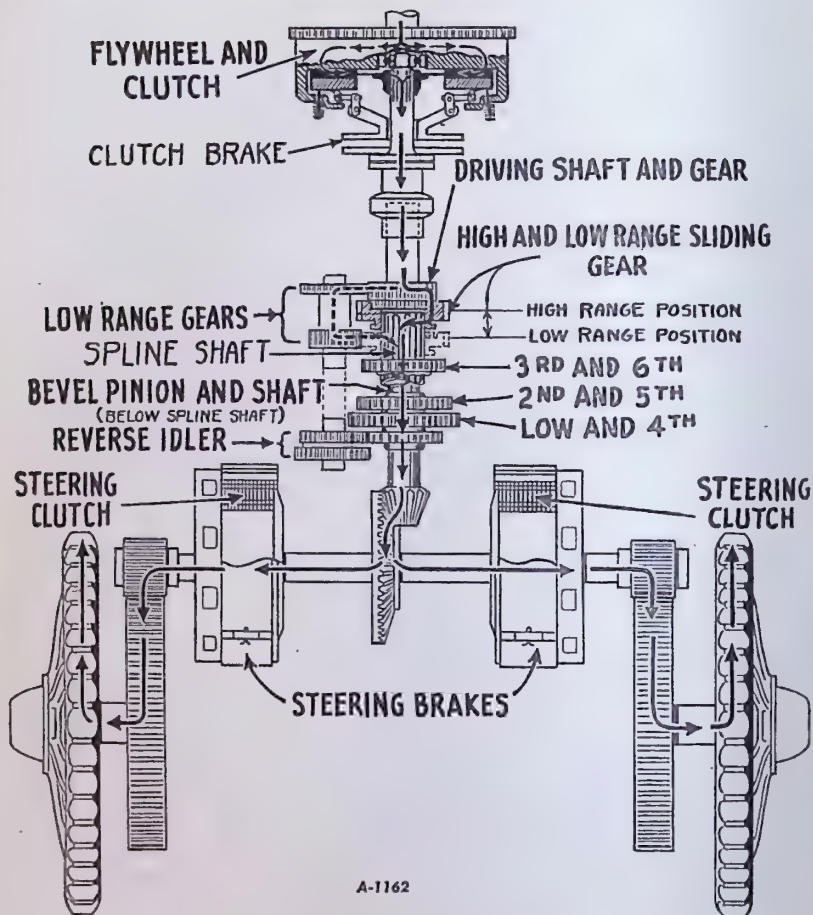
REPAIR SECTION

POWER TAKE-OFF - Continued

Belt Pulley - Continued

| Ref. No. | Description | Ref. No. | Description |
|----------|--------------------------|----------|--|
| 1 | Lock. | 33 | Bushing. |
| 2 | Washer. | 34 | Hex. Jam nut, 3/4" N.C. |
| 3 | Pulley. | 35 | Gear (24 teeth). |
| 4 | Key. | 36 | Spacer. |
| 5 | Cage with felt and seal. | 37 | Shim, heavy. |
| 6 | Gasket. | 38 | Shim, medium. |
| 7 | Felt. | 39 | Shim, light. |
| 8 | Oil seal. | 40 | Cage. |
| 9 | Spacer. | 41 | Bearing. |
| 10 | Bearing. | 42 | Washer |
| 11 | Pulley shaft. | 43 | Lock. |
| 12 | Pipe cap (1"). | 44 | Gasket. |
| 13 | Felt. | 45 | Cap. |
| 14 | Screen. | 47 | Key. |
| 15 | Pipe. | 48 | Shaft, (use with coupling). |
| 16 | Street ell (1"). | 49 | Fork (use with coupling). |
| 17 | Pipe plug (1"). | 50 | Lever. |
| 18 | Gear box with plugs. | 52 | Key. |
| 19 | Pipe plug (1-1/2"). | 53 | Shaft. |
| 20 | Shim, heavy. | 54 | Bearing, front. |
| 21 | Shim, medium. | 55 | Pulley coupling (16 teeth). |
| 22 | Shim, light. | 56 | Washer. |
| 23 | Lock. | 57 | Lock. |
| 24 | Washer. | 58 | Shifter coupling (16 teeth). |
| 25 | Pinion (15 teeth). | 59 | Gasket. |
| 26 | Retainer. | 60 | Retainer. |
| 27 | Bearing. | 64 | Belt pulley shifter hand lever. |
| 28 | Carrier. | 63 | Belt pulley shifter hand lever handle. |
| 29 | Pipe plug (1-1/2"). | 65 | Belt pulley shifter hand lever bracket. |
| 30 | Pin. | 61 | Belt pulley shifter lever rod adjusting block. |
| 31 | Poppet. | | |
| 32 | Spring. | 62 | Belt pulley shifter lever rod. |

POWER TRAIN



A-7162

Illustr. 1

Schematic Drawing Tracing the Line of Power from the Engine through the Engine Clutch, Transmission, Bevel Gear, Steering Clutches, Sprocket Drives, and Sprockets to the Tracks.

REPAIR SECTION

POWER TRAIN - Continued

Line of Power

The line of power from the engine is through the flywheel and engine clutch to the transmission and bevel gears. The power is distributed to both sides through the steering clutches to the sprocket drive gears, sprockets, and track chains on each side of the tractor.

The transmission has six forward speeds and two reverse speeds. Standard shifting is controlled by one lever while the change from the high to low range is controlled by another lever. An automatic clutch brake on the engine clutch comes into action to facilitate easy shifting of gears when the shift lever is pushed as far forward as possible. Gears are assembled on three shafts which are mounted in the rear main frame. The bevel pinion and shaft revolve on a straight roller bearing in a bearing cage next to the pinion. Ball bearings take the end thrust and the bearing cage is shimmed from the transmission end cover for cone setting of the bevel gear.

The upper shaft or spline shaft revolves in two ball bearings in

cages. It is hollow to allow the power take-off shaft to pass through it, thus driving direct from the drive gear assembly.

The Hi-Lo and reverse gear shaft is stationary in the main frame and the transmission end cover. The reverse gear revolves in two roller bearings and the Hi-Lo range gear revolves on its ball bearings.

The clutch brake operates automatically when the clutch is fully disengaged.

When both steering clutches are engaged, power is equally transmitted to each track. By disengaging one steering clutch all the power is applied to one track. If one steering clutch is disengaged and the steering brake applied or the same side, the tractor pivots on its track. The steering brake is a band around the steering clutch drum and is used only for pivot turns and parking purposes. Disengaging both steering clutches at the same time, or disengaging the engine clutch, stops the tractor.

REPAIR SECTION

MEMORANDA

REPAIR SECTION

STARTING SYSTEM

The International Diesel engine is temporarily converted to a gasoline engine during the starting process. After the engine is operated on gasoline for about a minute the starting mechanism is manually released and the engine operates on Diesel fuel as a full Diesel engine. To start the engine as an ordinary gasoline spark-ignition engine, the operator pulls down the speed control lever all the way. This shuts off all Diesel fuel supply to the nozzles from the fuel injection pump.

Operation

With the speed control lever in the shut-off position, lowering the compression release lever to the gasoline starting position moves the top of lever "D", *Illust. 1*, to the rear, turns cross shaft "J" in the crankcase which rotates bottom of lever "E" toward the front until it contacts lever "B" at point "X". Lever "E" turns lever "B" until latch "A" drops down behind the notch in lever "B", holding it in that position until changing to Diesel operation. See *Insert #1 in Illust. 1*.

As lever "B" starts to turn, rod "G" is raised, rotating lever "V" and shaft "CC" against tension of the spring attached to lever "AA", *Illust. 2*. The worm gear on shaft "CC" turns the gear on the starting valve shaft, pressing the roller "H" against retainer "I" and opening the starting valve. With this valve open, the compression ratio is reduced for gasoline starting.

As lever "B", *Illust. 1*, rotates, link "Y" is also advanced to the front. This turns a cam in the carburetor, releasing a spring attached to the float. This allows the needle valve to operate and admit the gasoline from the supply tank.

Lever "V" pushes rod "DD" as it rotates, and this movement to the rear turns a shaft in the air valve housing, *Illust. 4*. The valve lever (1), *Illust. 4*, is keyed to the shaft and is turned upward, lifting the air valve from its lower seat. As soon as lever (1) gets beyond the center position, the spring in the air valve housing snaps the valve against its upper seat. The air path is then down through the carburetor (see *Service Chart, Section 14*), and to the manifold, through the opening formerly covered by the air valve when on its lower seat. The copper contact (3), *Illust. 4*, attached to valve lever (1) is also lifted off the insulated contact (4), breaking the ground connection to the magneto, allowing it to distribute high-voltage current to the spark plugs.

After starting the engine on gasoline, the compression release lever is raised for the change to Diesel operation. Raising the lever advances the top of lever "D", *Illust. 1*, to the front, turns cross shaft "J", and rotates lever "E". The upper rounded end of lever "E" contacts latch "A", raising it sufficiently to release lever "B" from the offset in lever "A". Spring tension on lever "AA", *Illust. 2*, is applied to lever "B", *Illust. 1*, through shaft "CC", lever "V", and rod "G". Lever "B", therefore, snaps completely around until it strikes set screw "R". In so doing, it pulls link "Y" which turns the cam in the carburetor so that it engages the spring on the float, forcing the needle valve down on its seat, and cutting off the gasoline supply.

As rod "G" comes down with lever "B", lever "V" rotates with shaft "CC". The worm gear on the shaft rotates the starting valve shaft and lifts roller "H" off retainer "I", allowing the starting valve spring to snap the valve closed. This increases the compression ratio for Diesel operation by closing off the extra volume chambers in the head.

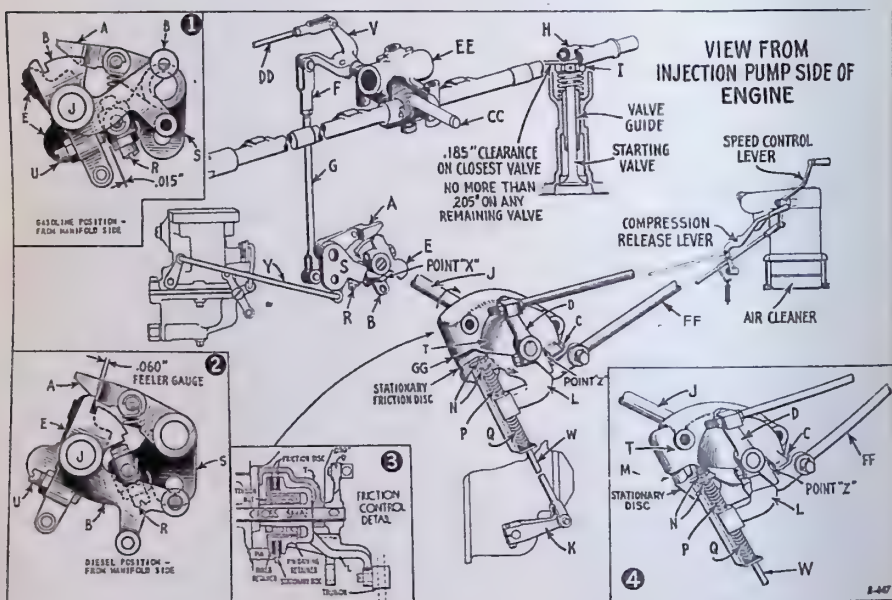
STARTING SYSTEM - Continued

Operation - Continued

As lever "V" is turned, rod "DD" is pushed to the front, turning the shaft in the air valve housing, removing the valve from the upper seat until the spring snaps the valve down against the lower seat.

The air path is now direct to the manifold.

As lever (1), *Illust. 4*, comes down, contact (3) engages contact (4), grounding the magneto and thereby cutting off the supply of high-voltage current to the spark plugs.



Illust. 1

Engine Starting Control Mechanism and Governor Friction Control.

Adjusting Starting Control Mechanism

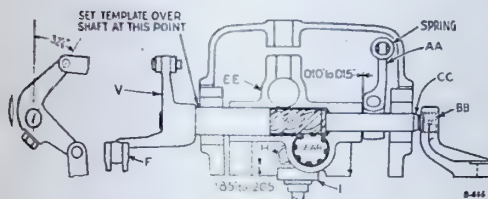
If engine controls have been removed for any reason, the first thing to do is to assemble all controls, cross shafts and their levers as shown in *Illusts. 1 and 2*. Do

not assemble the intake manifold and valve cover, nor connect yoke "F" to the lever "V". The cross shaft "J" should have .030" end play when checked between lever "D" and bracket "T" (see *Insert No. 3, Illust. 1*).

REPAIR SECTION

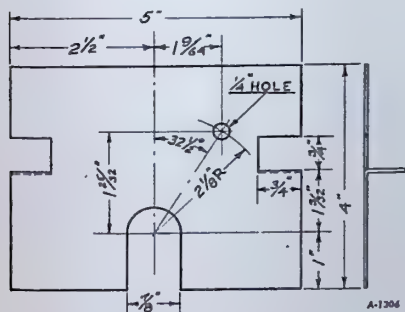
STARTING SYSTEM - Continued

Adjusting Starting Control Mechanism - Continued



Illustr. 2
Sectional Drawing of
Starting Mechanism Cross Shaft.

1. Make a sheet metal template according to the diagram on *Illustr. 3*.
3. Slide the template opening over shaft "CC", *Illustr. 2*, between lever "V" and the valve housing. Let the prongs rest on top of the valve housing, without its gasket. Insert a 1/4" pin through both lever "V" and the hole in the template to hold lever "V" at 32-1/2° with the vertical.



Illustr. 3
Template for Setting Starting
Cross Shaft for Adjusting Starting
Valve Roller Clearance.

2. The spring on top of lever "AA" holds the roller "H" for each cylinder away from the starting valve

spring retainer "I". Clearance between "H" and "I" should be .185" minimum for each roller and the greatest clearance for any one should be .205".

Place a .185" (3/16") gage under the roller with the least clearance, and adjust set screw "BB" to obtain this setting. The lever "AA" may be moved along shaft "CC" if screw "BB" requires much movement to the right. Replace the cotter key. Adjustments of screw "BB" rotates the starting valve roller shaft when cross shaft "CC" is held from rotating by the pin in lever "V" and the template.

3. There should be .010" to .015" clearance between lever "AA" and bracket "EE" after setting the valve clearance.

4. Back off set screws on the following levers, *Illustr. 1*: "R" on release lever bracket "S", "C" on cross shaft bracket "T", and "U" on jaw lever "B".

5. Set the compression release lever for Diesel operation. Latch "A" should be engaged behind jaw "B". Adjust set screw "R" in bracket "S" for .060" clearance between jaw "B" and latch "A" as shown in *Insert No. 2, Illustr. 1*.

6. Holding jaw "B" against set screw "R", adjust yoke "F" on rod "G" so that its pin can be slipped through yoke "F" into lever "V" with ease. Then replace the cotter key in the pin.

7. Lower the compression release lever until lever "E", behind jaw "B", contacts the offset pick-up face on lever "B" at the point "X". Now adjust set screw "C", on the opposite side of the engine, to give .100" between set screw "C" and lever "D" at the point "Z".

8. Lower the compression release lever to starting position or until latch "A" locks behind the notch in jaw "B" as shown in *Insert No. 1, Illustr. 1*.

REPAIR SECTION

STARTING SYSTEM - Continued**Adjusting Starting Control Mechanism - Continued**

9. Adjust set screw "U" in lever "B" to give a .015" clearance between the set screw and the stop on bracket "S" as shown in *Insert No. 1*. Lock with the lock nut. This clearance is overtravel of lever "B".

10. Attach the intake manifold to the engine and connect rod "DD" to lever "V". Adjust the yoke on rod "DD" to have the pin in the air valve lever approximately centered in the slot in the end of rod "DD", *Illust. 4*.

11. Trip the mechanism to Diesel position and check for the pin centering in slot in rod "DD". Adjust the yoke to obtain the best balance of centering the pin in the slot for both Diesel and gasoline operating positions.

12. Connect link "Y", *Illust. 1*, between the carburetor and lever "B".

13. Start the engine and run at idle speed on the Diesel cycle. The finger on lever "L" should just contact the spring plunger "M" in bracket "T", (*see Insert 4*). (On units with a poppet arrangement in place of the plunger "M", the poppet should drop into the hole in the stationary disc of the friction control). If the injection pump has been replaced, lever "K" can be set on the serrations of its shaft to make the engine idle at this position of the controls. Further adjustment can be made by turning nuts "N" on rod "W" until the engine idles when the finger of lever "L" just contacts plunger "M", or the poppet in lever "L" locates in the hole in the stationary disc.

14. Lower the speed control lever all the way for the shut-off posi-

tion of the pump. Plunger "M" should then extend $\frac{3}{32}$ " from the boss of bracket "T". (On units with a poppet arrangement the lever "L" should be against the bracket "T" at point "GG"). Adjust the yoke on the speed control rod to assure a complete pump shut-off if necessary. Spring "P" should be slightly compressed but not compressed solid. There is always tension on springs "P" and "Q" for cushioning the governor when operating.

15. Operate the engine at full throttle and inspect spring "Q". It too should be slightly compressed at this position. Adjustment of the stop screw on the air cleaner will provide proper tension on the spring.

Intake Manifold

The intake manifold is of the combination type, using a poppet-type valve to bypass air through a gasoline carburetor for starting purposes only. The operation, and adjustments necessary, are described in this section. The manifold assembly as removed from the engine consists of the starting carburetor with primer, the air valve assembly with magneto cut-out switch, and the intake manifold.

The entire unit can be removed after disconnecting the fuel line to the carburetor, removing cotter keys and disconnecting the primer and choke control rods, air valve operating rod "DD", *Illust. 1*, disconnecting the magneto grounding wire inside the air valve housing, and removing the nuts holding the manifold to the cylinder head, and the air pipe from the air cleaner. Removing four capscrews which hold the carburetor to the manifold and the same number of nuts which hold the air valve assembly to the intake manifold frees the manifold.

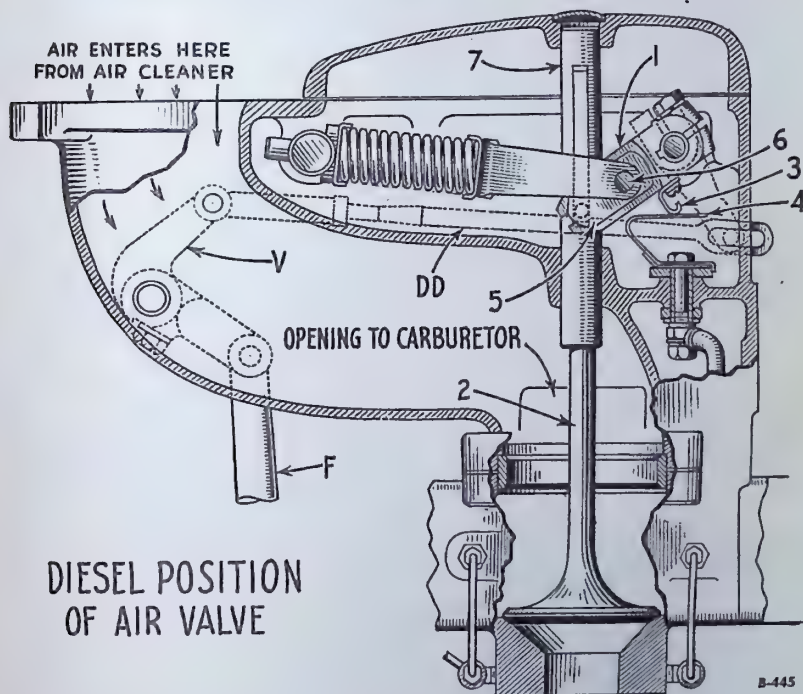
REPAIR SECTION

STARTING SYSTEM - Continued

Intake Manifold - Continued

Since no heat passes the air valve seats, they rarely require reseating. Valves can be re-lapped to the seats by removing the carburetor, controls, and manifold. The air valve should be in the gasoline starting position before starting to work. Take the cover of the

air valve housing and slip the pin retainers (5), *Illust. 4*, off the ends of the pin in the air valve. Use a screw driver. Next apply the screw driver between pin (6) and lever (1) and push forward sufficiently to relieve tension on the pin in the air valve, and slip out the pin. Lower the lever (1) to a position like that in *Illust. 4*.



Illust. 4

Cross Section of the Air Valve Housing on the Intake Manifold.

For lapping the lower seat in the manifold, the air valve housing must be assembled to the manifold. Apply lapping compound through the hole in the manifold, use a suction-cup type driving tool on the valve and hold the valve against the seat with slight pressure exerted on the end of the valve stem inside the valve sleeve (7). The sleeve must

remain assembled during all lapping operations.

For lapping the upper seat on the insert in the valve housing, remove the manifold and lap by the conventional method. Be sure to clean both parts thoroughly before reassembling.

REPAIR SECTION

STARTING SYSTEM - Continued

Intake Manifold - Continued

Reverse the disassembly procedure to reassemble. Draw up manifold stud nuts to 75 ft.-lbs. torque. Readjustment of controls will not be necessary.

Governor Friction Control

The engine is equipped with a governor friction control. It is composed of the unit located under the cross shaft operating bracket "T", *Insert 3, Illust. 1*. It prevents the play in the control linkage from interfering with the speed regulation and also holds the governor control lever at the speed selected. The friction unit is attached to the control lever "L" which turns freely on cross shaft "J", and is independent of the change-over mechanism. The end of lever "D", however, contacts lever "L" and prevents opening the throttle wide while the engine operates on the gasoline cycle. Two independent friction discs sandwich a stationary disc that is anchored to the side of the engine crankcase. *Insert No. 3, Illust. 1*, shows a cross section of this assembly. By removing the taper pin from lever "D", cotter keys from lever "L",

and - three capscrews from bracket "T", the entire assembly can be removed for adjustment of friction to hold the throttle at the position selected.

With the unit off, take out the spring and plunger "M". Reverse the inner assembly on the cross shaft to make adjustment easy (*see Illust. 5*). Turn the tension nut clockwise to increase the tension on the discs. Two holes are drilled in the tension nut for tightening purposes. A flat tool with two pegs can be used. Proper tension is obtained when a torque of 120 to 130 inch-pounds is required to turn the stationary disc with the control lever "L" held stationary.

Replace the spring and plunger after the bracket and inner assembly are replaced on the shaft and the stationary disc has engaged the pin in the crankcase. Replace the capscrews and connect up the controls.

The adjustment of the controls has not been changed. Referring to *Insert No. 3, Illust. 1*, the small pin in lever "L" drives the inner retainer. The tension nut is attached to "L", and the spring bears against the retainer holding the friction surfaces together.

Starting Carburetor

Type I.H.C. - C-12
Gasoline Supply. . . Gravity
Float Level. . . . 1/4" from top
of bowl
Adjustable Yes

The carburetor can be removed from the intake manifold after removing the fuel line, choke control, link and starting system controls, primer controls, and four bolts holding the carburetor to the manifold.

The primer can be unscrewed from the carburetor after the connector nut (11), *Illust. 6*, is removed from the primer (4), and the inlet tube (9) is withdrawn from the primer. Items (1), (2), (5),



Illust. 5
Increasing Tension on Governor
Control Discs.

REPAIR SECTION

STARTING SYSTEM - Continued

Starting Carburetor - Continued

and (6) are attached to the manifold. There are no service operations to be performed on the primer (4). If the primer fails to work, be sure inlet tube (9), and tubes and passages attached to and in the manifold, are all cleaned out before replacing the primer.

The fuel bowl (66) can be removed from the remainder of the assembly by taking out five capscrews. With the bowl inverted, the float (64) should be 1/4" inside the bowl. The float can be removed by withdrawing the float pivot screw (56). The needle valve (57) can be withdrawn from its cage. The cage can be removed with a screw driver or a socket wrench. The screen retainer (69) can be unscrewed from the bowl (66).

The bottom plate (60) can be removed after taking out three capscrews. The metering well (62) can be removed from the bottom plate (60) by applying a wrench to the hex end of the well. The drip hole filler (49) is retained with a plug (50) which has a hole in the center.

The inlet tube (9) for the primer (4) can be removed after unscrewing the tube gland (8) from the body (43). The cam (33) for locking the float valve on its seat can be removed after taking the nut (35) from the end of the control shaft (34). The shaft (34) can be withdrawn from the body (43) with the

dust washer (39), retainer (40), and spring (41). The shaft bearing (38) can be unscrewed from the body (43). The butterfly (31) can be removed after taking out the two screws (23). The removal of the shaft (24) then requires removing the clamp screw (28), cover (26), and the screw in the spring end (70).

The choke valve or shutter assembly (22) can be removed after removing the butterfly screws (21). The shaft (14) with attaching parts can then be removed.

Reassembly of the starting carburetor is the reverse of the disassembly procedure. Bend the float lever (54) to make the float rest 1/4" inside the bowl when the bowl assembly is inverted.

After replacing the carburetor on the manifold, start the engine and adjust the engine speed with stop screw (29) as outlined in the "Operations Section". With the exception of adjusting the engine speed, adjusting the float level, and thoroughly cleaning the carburetor of all gums, there should never be any occasion to disassemble the unit.

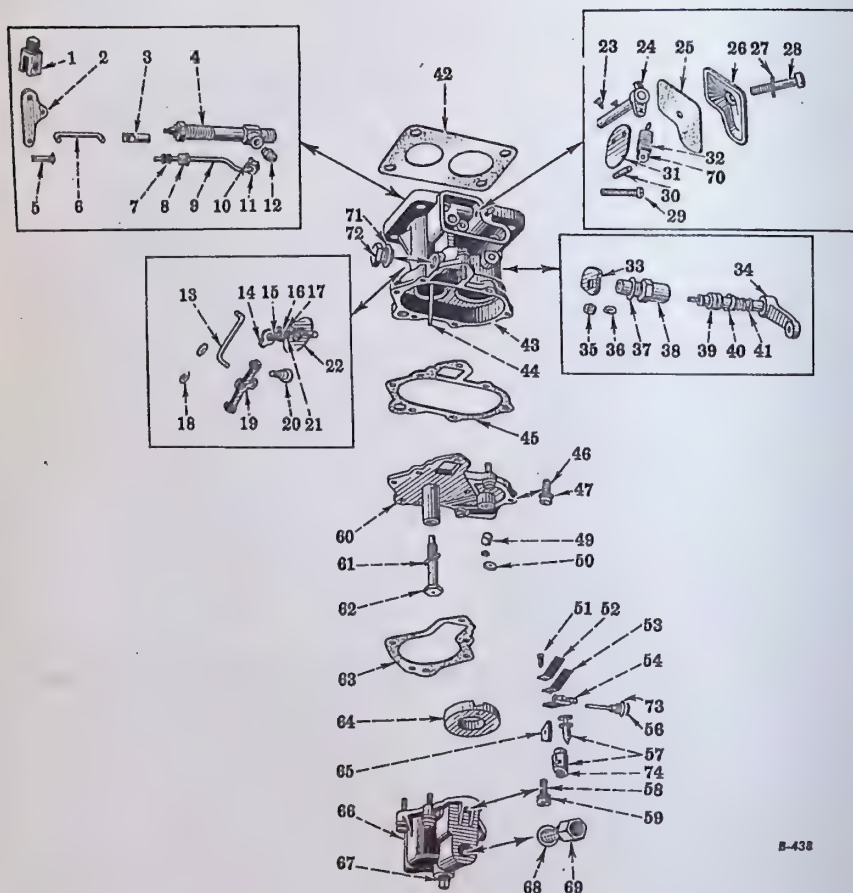
Spark Plugs

The gap should be .035" to .040". Clean or adjust the spark plug gap at least every 200 to 300 hours. Use a sand-blasting method of cleaning whenever possible. Check the gap when hard starting is encountered.

REPAIR SECTION

STARTING SYSTEM - Continued

Carburetor



Illustr. 6

Exploded View of the Carburetor for
Starting the TD-18 Diesel Engine.

B-438

REPAIR SECTION

STARTING SYSTEM - Continued

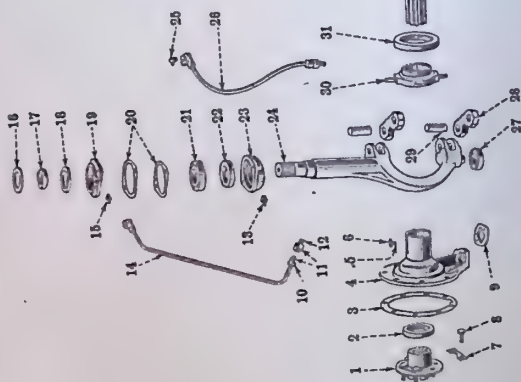
Carburetor - Continued

| Ref. No. | Description | Ref. No. | Description |
|----------|--------------------------------|----------|---------------------------------|
| 1 | Bell crank support. | 38 | Shaft bearing. |
| 2 | Bell crank. | 39 | Dust washer. |
| 3 | Rod end. | 40 | Retainer. |
| 4 | Primer assembly. | 41 | Spring. |
| 5 | Pin. | 42 | Gasket. |
| 6 | Rod. | 43 | Body. |
| 7 | Tube packing. | 44 | Tube. |
| 8 | Tube gland. | 45 | Gasket. |
| 9 | Inlet tube. | 46 | Lock washer for No. 12 screw. |
| 10 | Connector sleeve. | 47 | Screw, No. 12 - 24 x 3/4". |
| 11 | Connector nut. | 49 | Drip hole filler. |
| 12 | Inlet valve. | 50 | Plug. |
| 13 | Connecting rod. | 51 | Screw, No. 4 - 36 x 7/16". |
| 14 | Shaft and lever assembly. | 52 | Spring, upper leaf. |
| 15 | Packing spring. | 53 | Spring, lower leaf. |
| 16 | Retainer. | 54 | Float lever. |
| 17 | Packing. | 56 | Float pivot screw. |
| 18 | Washer. | 57 | Valve cage assembly. |
| 19 | Bell crank. | 58 | Screw, No. 12 - 24 x 1". |
| 20 | Screw. | 59 | Lock washer for No. 12 screw. |
| 21 | Butterfly screw. | 60 | Bottom plate. |
| 22 | Shutter assembly. | 61 | Gasket. |
| 23 | Butterfly screw. | 62 | Metering well. |
| 24 | Throttle shaft assembly. | 63 | Gasket. |
| 25 | Gasket. | 64 | Float with ferrule. |
| 26 | Cover. | 65 | Plate. |
| 27 | Screw gasket. | 66 | Fuel bowl. |
| 28 | Clamp screw. | 67 | Steel pipe plug, 1/8". |
| 29 | Stop screw. | 68 | Strainer screen gasket. |
| 30 | Stop pin. | 69 | Screen retainer. |
| 31 | Butterfly. | 70 | Spring end. |
| 32 | Spring. | 71 | Plug gasket. |
| 33 | Cam. | 72 | Plug. |
| 34 | Shaft and lever assembly. | 73 | Float lever pivot screw gasket. |
| 35 | Type "B" hex. nut, No. 8 - 32. | 74 | Needle valve cage gasket. |
| 36 | Lock washer for No. 8 screw. | | |
| 37 | Gasket. | | |

STEERING MECHANISM

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|-------------------------|----------|---------------------------|----------|------------------------------|
| 1 | Coupling (12 teeth). | 11 | Connector, complete. | 31 | Bearing. |
| 2 | Oil seal. | 12 | Connector. | 32 | Shaft. |
| 3 | Gasket. | 13 | Lubricator. | 33 | Plate. |
| 4 | {Cage cap, left hand. | 14 | Lower grease tube. | 34 | (See note.) |
| 5 | {Cage cap, right hand. | 15 | Lubricator. | 35 | Disc (external teeth). |
| 6 | Key pin. | 16 | Felt retainer. | 36 | Disc (internal teeth). |
| 7 | Collar key. | 17 | Spacer. | 37 | Retainer. |
| 8 | Bolt lock. | 18 | Felt. | 38 | Spring. |
| 9 | Coupling bolt. | 19 | Retainer. | 39 | Hub (58 teeth). |
| 10 | Fork lower bearing cap. | 20 | Gasket. | 40 | Pressure plate. |
| | Connector nut. | 21 | Bearing. | 41 | Pressure plate dowel bolt. |
| | | 22 | Oil seal. | 42 | Spacer. |
| | | 23 | Bearing cage. | 43 | Drum. |
| | | 24 | Release fork. | 44 | Pilot bearing. |
| | | 25 | Upper bearing lubricator. | 45 | Pilot bearing retainer. |
| | | 26 | Grease tube, complete. | 46 | Pilot bearing retainer bolt. |
| | | 27 | Lower bearing. | 47 | Pin. |
| | | 28 | Collar shifter link. | 48 | Lubricator pipe. |
| | | 29 | Shifter link pin. | 49 | Lubricator. |
| | | 30 | Release collar. | | |

NOTE: This assembly is made up of a group of friction discs (Ref. No. 35) and driving discs (Ref. No. 36).



Illustr. 1
Exploded View of the Steering Clutch and Release Fork.

REPAIR SECTION

STEERING MECHANISM

Steering Clutches

There are two 15-inch multiple dry-disc, spring-loaded type steering clutches. They are located in separate compartments, one on each side of the bevel gear compartment at the rear of the main frame. They can be removed individually with their release mechanism without disturbing the bevel pinion adjustment or sprocket drive assembly.

Removal of the Steering Clutches

To remove either steering clutch proceed as follows:

1. Drain oil from the transmission.
2. Remove the seat frame, fenders, fuel tank, batteries, and supports, being sure to disconnect the fuel lines and electric wiring.
3. Remove from the main frame cover the two inspection covers and the clutch lubricator grease tube fitting bolts; the springs, cap screws, retainers, and levers on top of the release forks; the transmission gear shifter housing; and cap screws and dowel pins.
4. Remove the main frame cover.
5. Tap the bearing cage (23), *Illustr. 1*, from the release fork (24).
6. Loosen the brake band adjuster and take out the cotter key and pin from the steering brake band at the rear.
7. Remove the grease tubes (14) and (26), connected to the release collar (30), and the release fork lower bearing (27).
8. Remove the upper pin (29) from the release fork (24) by taking out the lower cotter key. Then turn the fork and lift the upper link (28) from the release collar (30).

9. Remove the lower pin (29), from the release fork by taking out the upper cotter key. Push the pin down to free the link. Turn the release fork and remove the lower link (28) from the release collar.

10. Lift out the release fork (24).

11. Remove the cap screws from the bearing cage cap (4), and slide the cap into the steering clutch.

12. Remove the two diametrically opposite cap screws (53), *Illustr. 2*, from the hub plate (33). Assemble the clutch compressor angle tool with two 5/8" N.C. x 1-1/2" and two 1/2" N.C. x 2-1/4" bolts. Turn in the bolts as far as possible to compress the spring (38) and disengage the steering clutch. The spring retainer (37) will move in until it contacts the hub (39) after approximately 1/2" travel.

13. Bend back the locks and remove the special cap screws (8) from the clutch coupling (1). Turn the bevel gear to make all cap screws accessible.

14. Remove cap screws from the steering clutch drum (43) at the sprocket drive pinion flange (51). Revolve the drum with a bar to make all cap screws accessible. Mark the relative position of the drum on the flange so that the grease tube lines up with the notch at the center of the flange when reassembling. Cap screws are not all evenly spaced around the drum.

15. Put a sling on the clutch drum, pry the coupling (1) into the bearing cage cap (4), knock the assembly off the flange (51), and lift out.

REPAIR SECTION

STEERING MECHANISM - Continued

Replacement of the Steering Clutches

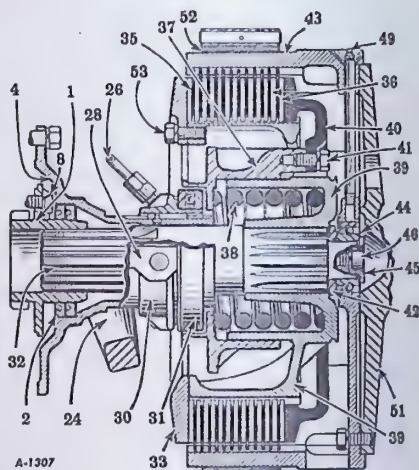
Steering clutches can be replaced by reversing the above procedure.

The bearing cage cap gasket (3), *Illust. 1*, should be attached to the main frame before installing the clutch; the gasket is more easily protected from damage by doing this. Then compress the clutch as far as possible. Be sure that the socket head bolt (46) in the steering clutch shaft (32) is tight. The pin (47) in the retainer (45) fits into the drum (43) to keep the inner race of the bearing (44) from revolving on the shaft. It also maintains bolt tension.

The bearing cage cap (4) and coupling (1), *Illust. 2*, can be slid off the shaft to replace the double leather oil seal (2). Always install a new seal. A handy driver for this seal is provided by the coupling. Assemble the coupling bolts (8) to the coupling and slide the oil seal onto the coupling with the lips of the seal toward the flange of the coupling. Then use this assembly to press or drive the oil seal into the bearing cage cap (4). Be sure that the seal bottoms in the counterbore of the bearing cap.

Lubricate the finished surface of the bearing cage cap and slide the assembly onto the clutch shaft (32) together with the release collar (30) and the release bearing (31). Be sure that the collar slides freely on the cap.

Use several capscrews to draw the steering clutch drum (43) onto the flange of the sprocket drive pinion shaft (51) before centering the coupling (1) and prying it into the hub of the bevel gear. Then insert the coupling bolts (8) (punch-marked for identification) and lock them for tightening.



Illust. 2
Cross Section of
Steering Clutch Assembly.

1. Clutch Coupling; 2. Bearing Cage Cap Oil Seals; 4. Bearing Cage Cap; 8. Clutch Coupling Bolt; 14. Release Fork Bearing Grease Tube; 24. Release Fork; 28. Release Collar Shifter Link; 30. Clutch Release Collar; 31. Clutch Release Bearing; 32. Clutch Shaft; 33. Hub Plate; 35. Clutch Disc, External Teeth; 36. Clutch Disc, Internal Teeth; 37. Spring Retainer; 38. Spring; 39. Hub; 40. Pressure Plate; 41. Pressure Plate Dowel Bolt; 42. Bearing Spacer; 43. Clutch Drum; 44. Pilot Bearing; 45. Pilot Bearing Retainer; 46. Pilot Bearing Retainer Bolt; 48. Pilot Bearing Lubricator Pipe; 51. Sprocket Drive Pinion Shaft; 52. Steering Brake Band; 53. Hub Plate Bolt.

REPAIR SECTION

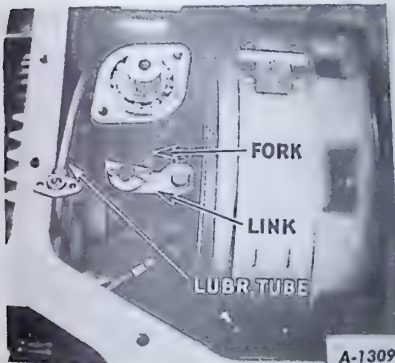
STEERING MECHANISM - Continued

Replacement of the Steering Clutches - Continued

After assembling links (28) *Illust. 1*, to the release fork (24) and the release collar (30), the cotter keys previously removed can be replaced (see *Illust. 3*). Turn the fork to one side and spread one side of the key with a long screw driver or rod inserted through hand holes in the rear of the main frame.

Lubricate the pins of the release collar and release fork before replacing the main frame cover.

The clutches can be adjusted according to instructions in the "Operations Section".



Illust. 3

View Looking from the Front of the Left Steering Clutch, Assembled.

Replacement of the Discs

With the clutch removed from the tractor the discs can be removed.

1. Assemble 1/2" capscrows to the three tapped holes in the pressure plate (40), *Illust. 1*. The clutch can be compressed by turning these capscrows in.

2. If compressor angle tools have been used, they should be removed after turning the capscrows all the

way in. On a clutch without the compressor tool assembled, the use of capscrows in the pressure plate (40) forces the plate to the right of the hub (39), *Illust. 2*, or compresses the spring (38), or the pressure plate (40) moves while the hub holds its position on the shaft (32).

3. Now remove capscrows (52) from the hub plate (33) and lift it off.

4. The discs with internal teeth (36), and those with external teeth (35) can now be removed from the hub and the drum.

5. The drum (43) and shaft (32) can be removed from the assembly consisting of the hub (39), pressure plate (40), spring retainer (37), and the spring (38).

6. Remove the socket head bolt (46), the retainer (45), and slide the shaft (32) out of bearing (31).

7. The bearing with its snap ring can be removed from the drum.

8. The spring (38) can be removed by holding the assembly with an arbor press, removing capscrows from the tapped holes of the pressure plate (40) and the three capscrows (41) holding the pressure plate (40) to the three prongs of the spring retainer (37).

9. The free length of the clutch spring is 8-13/16". The spring should rest evenly in both the retainer and the hub. The inside of the hub should show no marks caused by the spring binding on its sides.

10. The outside surface of the hub (39) which contacts the retainer should be smooth so that the retainer (37) will slide freely on the hub (39). If the hub shows marks from binding in the retainer (37), assemble two capscrows to the retainer and pressure plate (40). The third hole in the pressure plate should line up perfectly with the third tapped hole in the retainer (37). Any force used to remove the third bolt will cause the retainer to bind on the hub.

REPAIR SECTION

STEERING MECHANISM - Continued

Replacement of the
Discs - Continued

11. When assembling the retainer (37), the spring (38), the hub (39), and the pressure plate (40), arrange the pressure plate on the hub so that the prongs of the retainer are centered in the holes of the hub. There should be $5/32$ " to $7/32$ " radial clearance.

12. The teeth on the hub, drum, and pressure plate should be smooth, as well as all surfaces of the internal and external teeth discs.

13. The assembled clutch should run true, and the outside diameter of the coupling (1) should be concentric with the outside diameter of the drum (43).

After assembling dowel pins to the main frame cover, place the release lever on the shaft of the release fork and check the free travel of the clutch for any possible binding of parts. Adjust the levers as outlined in the "Operations Section".

Steering Brakes

A steering brake is provided for each steering clutch. Its purpose is to stop the clutch drum from rotating after the steering clutch has been disengaged. Depressing one brake locks the track on that side and forms a pivot point for short turns. The brakes can also be used for parking purposes. Each can be locked in position. Pedals for each brake are adjustable to suit the operator. The brakes are simple and readily accessible, contracting on the steering clutch drums.

The bands can be relined after removing them through convenient holes in the bottom of the main frame. No other part of the tractor need be removed.

Replacement of Brake Linings

Release the tension on the hand adjusting knob (16), *Illust. 4.*

Then remove the hand hole covers from the bottom of the steering clutch compartments. Unhook the anchor spring (26) from the brake band and turn out set screw (28). Turn out the adjuster bolt (22) to free the band. Remove the cotter key and pin (24) from the linkage.

Take out the shaft stud (42) from the center end of the pivot shaft (43) and work the shaft to the side to free the pivot lever (23). Use a screwdriver in the notches in shaft (43). Pull down on the pivot lever (23) to slide the band from around the brake drum.

Reline the bands, being sure to countersink the rivets well.

The bands can be replaced in the tractor by reversing the above procedure.

Replacement of Main Frame
Brake Shaft Bushings

To replace these bushings, (5) and (19), *Illust. 1, Section 6*, remove the outer rod (7) *Illust. 4*, from the lever (34).

Remove the main frame cover. Attach a wire to the spring (31), and disconnect it from the anchor (45) and the inner rod (25). A hole is provided inside the main frame through which the lock bolt in the inner lever (33) can be removed. Then pull out the outer lever (34).

Knock out caps (6) and (20), *Illust. 1, Section 6*, on the side of the main frame and drive out the bushings (5) and (19).

The dust seals (5), *Illust. 4*, in the main frame can be replaced.

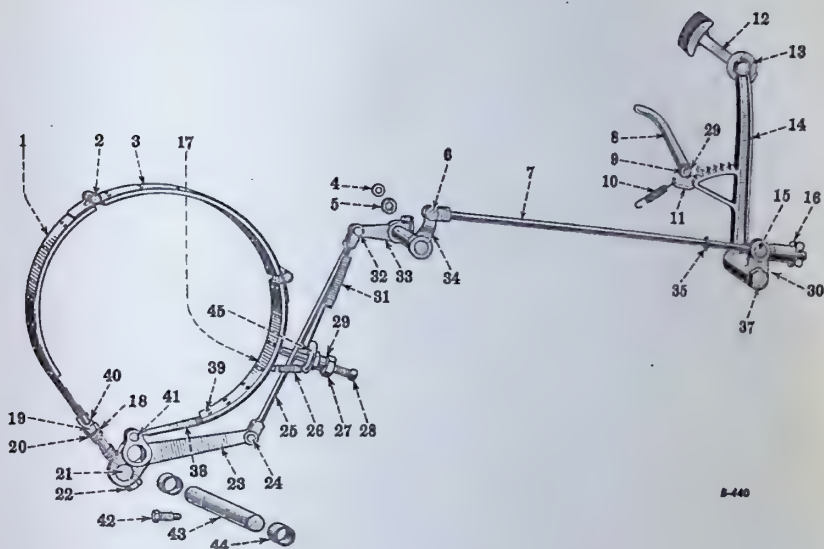
Replace the bushings and press them in. The brake shaft bushings are furnished reamed to size.

The remaining steering brake assembly can be removed as previously described after which the pivot lever (23), *Illust. 4*, brake rod (25), and brake rod lever (33) can be pulled out through the bottom of the main frame.

REPAIR SECTION

STEERING MECHANISM - Continued

Steering Brakes and Controls



Illustr. 4
Steering Brake Assembly, Complete.

| Ref. No. | Description | Ref. No. | Description |
|----------|-----------------------|----------|--------------------------|
| 1 | Band, rear. | 23 | Lever. |
| 2 | Pin. | 24 | Pin. |
| 3 | Band, center. | 25 | Rod, inner. |
| 4 | Key for lever, inner. | 26 | Anchor spring with hook. |
| 5 | Seal. | 27 | Nut, 5/8" N.C. |
| 6 | Rod pin. | 28 | Set screw. |
| 7 | Rod, outer. | 29 | Lock washer, 1". |
| 8 | Pawl. | 30 | Pedal shaft lubricator. |
| 9 | Pawl stud. | 31 | Release spring. |
| 10 | Pawl spring. | 32 | Pin, upper. |
| 11 | Pawl link. | 33 | Lever, inner. |
| 12 | Pedal pad. | 34 | Lever, outer. |
| 13 | Swivel. | 35 | Washer. |
| 14 | Pedal. | 37 | Pedal shaft. |
| 15 | Pivot pin. | 38 | Band, front. |
| 16 | Adjusting knob. | 39 | Lining rivet. |
| 17 | Brake band lining. | 40 | Adjusting bolt spacer. |
| 18 | Washer. | 41 | Pin. |
| 19 | Hex. nut, 5/8" N.F. | 42 | Shaft stud. |
| 20 | Spring. | 43 | Pivot shaft. |
| 21 | Pin. | 44 | Bushing. |
| 22 | Bolt. | 45 | Anchor. |

REPAIR SECTION

MEMORANDA

REPAIR SECTION

TRACK

Track Chain

The track links are drop-forged, heat-treated steel. The track pins and bushings are machined, carburized, hardened steel forced into the links under great pressure. The pins move freely in the bushings but the ends are a press fit in the links. The left and right tracks are interchangeable.

Removal of the Track Chain

The track chains are easily removed. Each chain has a master pin identified by a locking wire. Have this pin at the front for easy removal. Take out the wire and drive the pin out of the links. Then back up the tractor to shed the track.

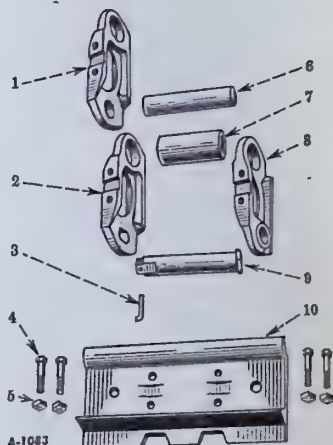
Replacement of the Track Chain

Lay the replacement track in line with the track being removed. Have the link without the bushing toward the tractor. Run the tractor forward on the new track. Then pick up the end of the new track and engage the bushings in the sprocket teeth. Guide the track around the sprocket and over the idlers as the tractor moves ahead. Line up the link and the bushing with a bar. Install the master pin and replace the lock wire.

Repair of the Track

Worn parts can be replaced by one of two methods, both of which require a hydraulic press with a special adapter head and fittings. The pin diameter is 1.622-inch to 1.625-inch and the clearance is .005-inch to .020-inch.

The track can be repaired when the shoes are on the chain or off the chain.



Illustr. 1
Exploded View of Track Link,
Pin and Shoe Assembly.

| Ref. No. | Description |
|----------|-------------------|
| 1 | Link, right hand. |
| 2 | Master link. |
| 3 | Lock wire. |
| 4 | Cap screw. |
| 5 | Nut. |
| 6 | Pin. |
| 7 | Bushing. |
| 8 | Link, left hand. |
| 9 | Master link pin. |
| 10 | Track shoe. |

The following procedure should be followed when the track shoes are assembled to the track:

Remove the track chain. Then press pin (6), Illustr. 1, all the way out of each link which needs repairing,

REPAIR SECTION

TRACK - Continued

Repair of the Track - Continued

replacement, or reboring. Drive the old bushing (7) out and the new bushing in during the same operation when a bushing needs replacement. Place the links in relation to the track and push the pin (6) into the assembly joining the links into a chain. If link (1) or (8) needs replacement, push out the old bushing only. Then the link can be replaced.

To repair the track when the shoes are removed from the chain, follow this procedure:

Remove the track chain. Push pin (6) just out of the "first link" (8). NOTE: Carry each of the operations to completion for the entire length of the track to be repaired before proceeding to the rest of the operation.

The words "first link" imply that link (8) is removed separately.

The words "second link" imply that link (1) is removed with one pin (6) and one bushing (7) assembled to it.

Push the bushing (7) just out of the "first link" (8). After the pin and the bushing are out of the "first link", the sections of the track being repaired are composed of several loose links (8) and several three-piece assemblies (1), (6), and (7) consisting of one link (1), one track pin (6), and one bushing (7). These assemblies can be separated from the chain by sliding the pin out of the next bushing.

The following steps pertain to the dismantling of these three-piece

assemblies, and reassembling them with new pins and new bushings.

Push bushing (7) out of the "second link". Push pin (6) out of the "second link". Push the new bushing (8) into the "second link".

Then push new pin (6) into the "second link". Push bushing (7) into the "first link" (1) while assembling the section of the track to the track chain. Then push the pin into the "first link".

Track Rollers

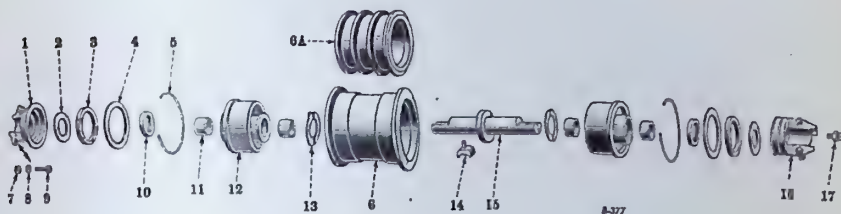
Five track rollers on each side carry the weight of the tractor. These rollers are welded, heat-treated, steel-forged fittings with special alloy carriers with four bronze bushings which rotate on heat-treated steel shafts. They are effectively sealed at each end by three individual washers and a spring-loaded, double-leather seal with the lips of the seal turned out. The rollers are gravity-lubricated at low turning speeds and pressure-lubricated at high speeds.

The rollers can be removed with or without removing the track chain. One of the easier and faster methods of removing all rollers is to remove the track chain but do not run off the track. Take out the two bolts in the front idler adjuster and slide the front idler assembly off the track frame. Then take off the track roller shields. Take out all bolts in the track roller brackets, jack up the track frame at the front, and slide all the rollers out the front of the track.

REPAIR SECTION

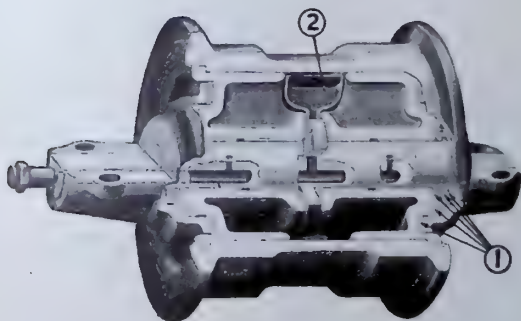
TRACK - Continued

Track Rollers - Continued



Illustr. 2
Exploded View of the Track Roller.

| Ref. No. | Description | Ref. No. | Description |
|----------|---------------------------|----------|------------------------|
| 1 | Bracket (inner). | 9 | Bolt. |
| 2 | Felt washer, outer. | 10 | Oil seal. |
| 3 | Felt washer, center. | 11 | Carrier bushing (set). |
| 4 | Cork washer, inner. | 12 | Carrier (set). |
| 5 | Snap ring. | 13 | Thrust washer (set). |
| 6 | { Roller (double flange). | 14 | Oil scupper. |
| | { Roller (single flange). | 15 | Shaft. |
| 7 | Nut, 5/8" N.F. | 16 | Bracket, outer. |
| 8 | Lock washer, 5/8". | 17 | Lubricator. |



Illustr. 3
Cross Section of Track Roller.

1. Five Oil Seals; 2. Oil Scupper
for Pressure Lubricator.

REPAIR SECTION

TRACK - Continued**Disassembly of the Track
Rollers**

The inner (1) and outer (16) brackets, *Illust. 2*, can be slipped from the shaft (15). The outer felts (2), center felts (3), and corks (4) can also be removed. Then pry out the snap rings (5).

Place the roller (6) in an arbor press; by forcing out the shaft (15), one carrier (12) will come out of the roller. Then the other carrier can be forced from the roller. The shaft (15) can be lifted out of the carrier (12) and the oil scupper (14) can be removed.

The thrust washers (13) should be replaced if they are damaged or worn.

The carrier bushings (11) are replaceable, reamed to size, and need only be pressed in place, bevel first, until they are flush with the face of the carrier (12). Be sure all the oil holes are clean.

**Reassembly of the Track
Rollers**

With the aid of an arbor press, force one carrier (12) into the roller (6) until the flange of the carrier bottoms in the counterbore of the roller. Then insert the snap ring (5).

Place one thrust washer (13) in the carrier assembly, being sure that the lugs of the thrust washer engage the slots provided in the carrier.

With the oil scupper (14) inserted in the shaft (15), replace the shaft in the carrier roller assembly. With the other thrust washer in place, line up the lugs of the washer with the slots of the second carrier and put the second carrier in place until it bottoms in the counterbore. Then replace the second snap ring (5).

Slots in the carrier (12) may be lined up with the lugs on the washers (13) by holding the shaft (15) against the carrier as it is being pressed into the roller.

Replace new oil seals (10) in the carriers. The lips of the oil seals must face away from the center of the shaft. Assemble the felt washers (2) and (3) (saturated with oil) and the cork washers (4) to the carrier. Brackets (1) and (16) can then be replaced, as can the lubricator (17). The entire roller assembly can then be replaced on the tractor.

Track Idler

The upper section of the track between the sprocket and the front idler is supported by two grey-iron idlers with shielded outer faces (increased hardness). They are mounted on brackets extending upward from the track frame. The idlers revolve on heat-treated, replaceable steel shafts which are locked in the brackets with bolts. A felt washer and spring-loaded leather seal with the lip turned toward the tractor are located in the bracket and idler respectively.

Each idler can be removed by blocking up the track chain, taking out the cap screws in the cover and those holding the retainer washer to the shaft. Removing the bolt from the bracket frees the shaft.

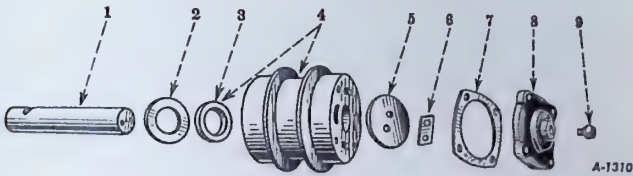
Disassembly of the Track Idler

Take out the cap screws from cap (8), *Illusts. 4 and 5*, to remove the cap and gasket (7). Bend back the lock (6) and remove the two cap screws to release the washer (5). Then the idler (4) with the seal (3) can be pulled off the shaft (1). Washer (2) is then removed. If necessary, the bolt may be removed from the shaft, and the shaft driven from the spring guide or retainer.

REPAIR SECTION

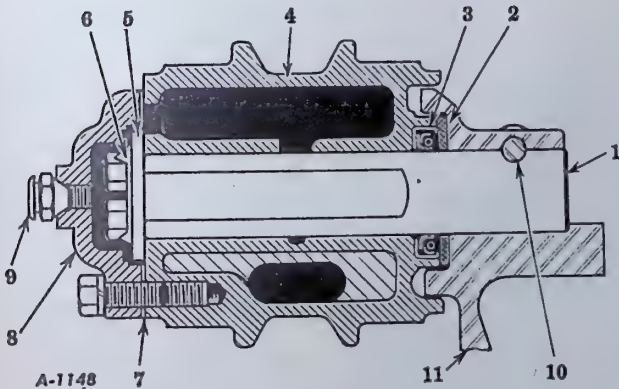
TRACK - Continued

Track Idler - Continued



Illust. 4
Exploded View of the Track Idler.

| Ref. No. | Description | Ref. No. | Description |
|----------|-----------------|----------|----------------|
| 1 | Shaft. | 7 | Gasket. |
| 2 | Washer. | 8 | Cap. |
| 3 | Seal. | 9 | Lubricator. |
| 4 | Idler and seal. | 10 | Retainer bolt. |
| 5 | Washer. | 11 | Support. |
| 6 | Lock. | | |



Illust. 5
Cross Section of Track Idler.

REPAIR SECTION

TRACK - Continued

Reassembly of the Track Idlers

The reassembly of the idlers is the reverse of disassembly. Be sure to use a new oil seal (3) with the lip of the seal facing the tractor. Be sure that the lubricator (9) is clean when replaced.

Front Idler

Front idlers for the track chains are slide-mounted to the track frames. Tension on the track chains is adjustable at the idler slide mount or guide. Two heavy coil springs on top of the track frame as shown in *Illust. 4, "Frame"* Section 6, permit the idlers to recoil under shock but exert no tension on the track when in the normal operating position.

Removal of the Front Idlers

It is not necessary to remove the track frame assembly to take off the front idlers. Remove the track chain. Then remove the cap screws from the adjuster (15), *Illusts. 6 and 7*, and slide the entire front idler assembly off the tractor frame.

Disassembly of the Front Idler

Both retainers (4) can be removed if necessary for replacement by bending back lock (5) and taking out the cap screws. Bend back the nut locks (2) on both sides and unscrew nuts (1) and (18). The nut for the lubricator should always be placed on the outside.

Take out the four bolts (16) to remove the cross plate (17). The inner and outer guides (3) then may be removed to slide off shaft (13).

Remove key (12). Take off the carriers (8) from the idler (11).

When one of the carriers is removed, the shaft (13) slides out. Then the second carrier can be removed. The shaft diameter is 2.243-inch to 2.244-inch. The bushings are replaceable, reamed to size. They should be pressed into the idler, bevel first, until they are flush with the inside diameter. Clearance is normally .005-inch to .008-inch.

The seal (6) and washer (7) can then be removed from the carriers (8). When replaced, the seals (6) must have the leather lip facing toward the center of the idler (11). The thrust washer (10) can be removed from the carriers (8). In replacing the thrust washers, have the projections engage the slots in the carriers and be sure the surfaces are clean.

The lubricator (14) can be unscrewed from shaft (13). Before reassembling, make sure that the drilled holes for lubrication are clean.

Reassembly of the Front Idler

Reassembly is the reverse of disassembly. Be sure that the seals (6) have the leather lip facing toward the center of the idler (11). The thrust washers (10) must engage the slots in the carriers. Be sure the surfaces are clean. Before reassembling the lubricator (14) to the shaft, be sure that the drilled holes for lubrication are clean. Be sure to use new washers (7) and new seals (6).

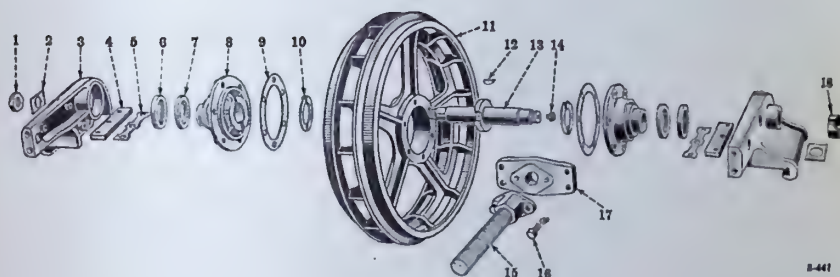
Replacement of the Front Idler

Replacement on the tractor is the reverse of removal. Be sure the proper adjustments are made after the idlers are on the tractor to prevent them from cocking and also to prevent the tractor from creeping to one side.

REPAIR SECTION

TRACK - Continued

Front Idler - Continued



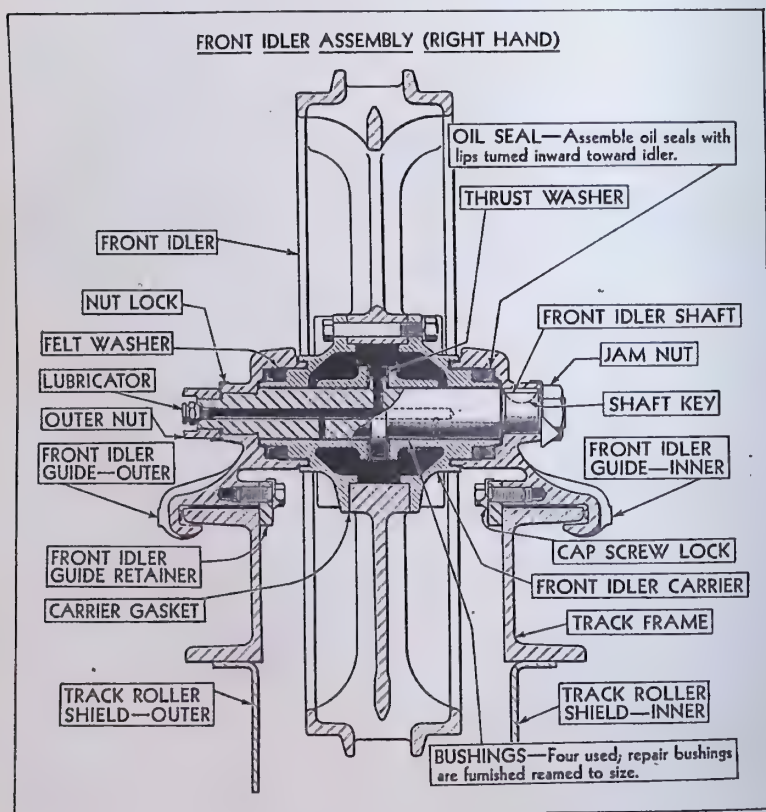
Illustr. 6
Exploded View of Front Idler.

| Ref. No. | Description | Ref. No. | Description |
|----------|---------------------------|----------|-----------------------------|
| 1 | Hex. jam nut, 1-1/2" N.F. | 10 | Thrust washers(set of two). |
| 2 | Nut lock. | 11 | Idler. |
| 3 | Guide, inner and outer. | 12 | Key (Woodruff No. G). |
| 4 | Retainer. | 13 | Shaft. |
| 5 | Lock. | 14 | Lubricator. |
| 6 | Seal. | 15 | Adjuster. |
| 7 | Washer. | 16 | Bolt, 5/8 x 1-1/2" N.F. |
| 8 | Carrier. | 17 | Cross plate. |
| 9 | Gasket. | 18 | Nut, outer. |

REPAIR SECTION

TRACK - Continued

Front Idler - Continued



B-384

Illustr. 7
Cross Section of Front Idler.

REPAIR SECTION

TRANSMISSION

| <u>Gear</u> | <u>M.P.H.</u> | <u>F.P.M.</u> | <u>Gear Ratio</u> |
|--------------|---------------|---------------|-------------------|
| 1 | 1.5 | 132 | 80.0 to 1 |
| 2 | 2 | 176 | 60.3 to 1 |
| 3 | 2.3 | 220 | 48.8 to 1 |
| 4 | 3.3 | 290 | 37.1 to 1 |
| 5 | 4.6 | 405 | 26.6 to 1 |
| 6 | 5.7 | 502 | 21.5 to 1 |
| Low Reverse | 1.5 | 132 | 84.0 to 1 |
| High Reverse | 3.3 | 290 | 37.1 to 1 |

The transmission is of the selective, spur-gear type, having six forward speeds and two reverse speeds. Standard shifting is controlled by one lever, while the change from the high to the low range is controlled by another lever. The gears are assembled on three shafts which are mounted in the rear main frame.

The upper spline shaft (35) *Illust. 1*, revolves on two ball bearings in cages. It is hollow to allow the power take-off shaft to pass through it, thus permitting the power take-off to drive direct from the drive gear assembly.

The bevel gear and pinion shaft (87) revolves on a straight roller bearing in a bearing cage next to the pinion. Ball bearings take the end thrust and the bearing cage is shimmed from the transmission end cover for the cone setting of the bevel gear. The Hi-Lo and reverse idler shaft (61) is stationary in the main frame and the transmission end cover.

The reverse idler gear revolves on two roller bearings as does the Hi-Lo gear. The rear bearing is a double-row ball bearing.

The Line of Power, *Illust. 1*, Section 9, shows the flow of power through the transmission. The

Service Chart, Section 14, shows the relation of the parts and the procedure for removal.

Splash lubrication is provided from the constant running oil gear. The reservoir capacity is 7-1/2 gallons.

Preparation for Removal of the Transmission

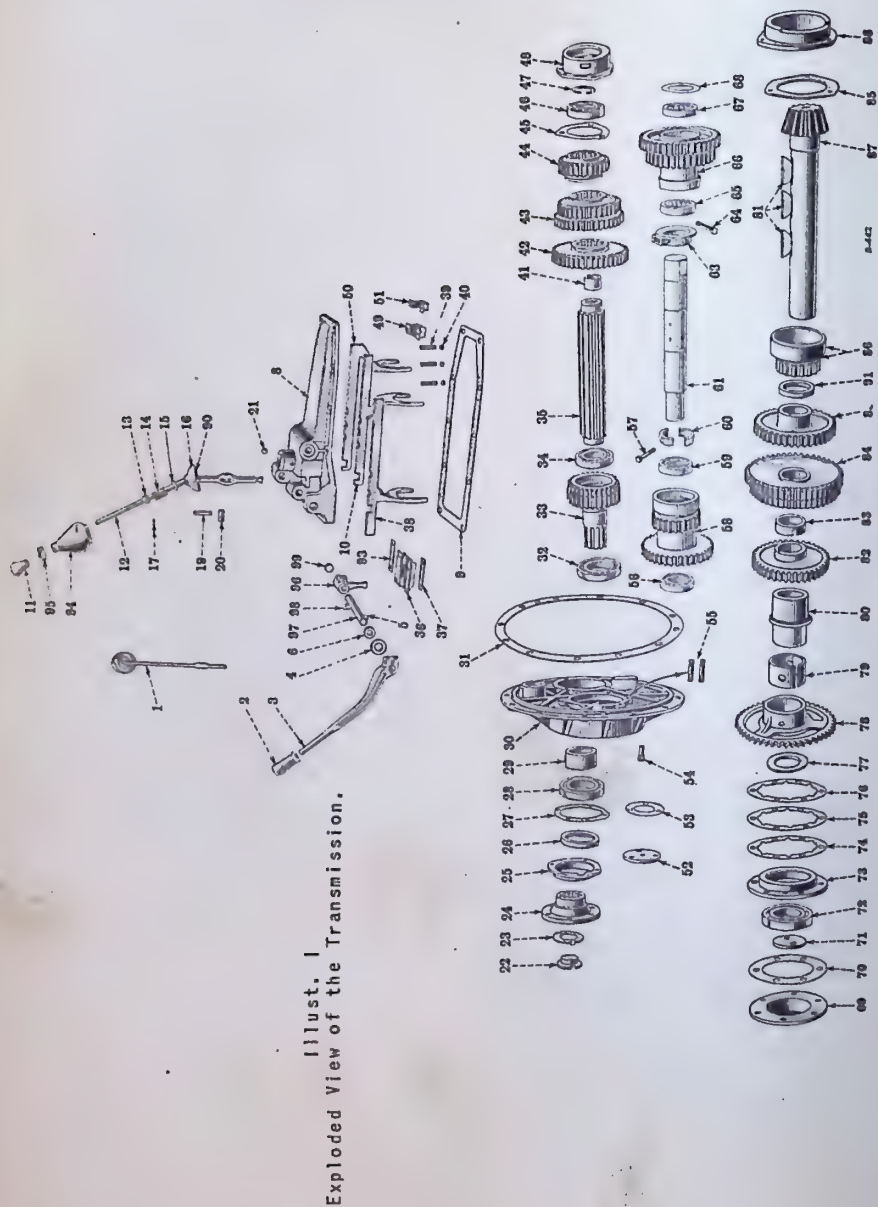
Remove the seat cushions and battery covers. Remove the braided ground cable from the positive terminal of the left battery. Disconnect the cable between the battery, starting with the terminal right battery. Then remove the cables from the negative terminals of both batteries. The battery supports are spring-mounted and can be readily taken out when the batteries are removed.

The fuel tank and complete seat can be removed as a unit. Take off the fender brackets.

The main frame cover comes off after the following steps have been accomplished. Remove the cap-screws from around the outside edge of the main frame cover. Disconnect the electrical wiring and label all of the wires for easy replacement. Refer to the wiring diagrams in the "Parts List".

REPAIR SECTION

TRANSMISSION - Continued



REPAIR SECTION

TRANSMISSION - Continued

| Ref. No. | Description | Ref. No. | Description | Ref. No. | Description |
|----------|------------------------------|----------|--|----------|---|
| 1 | Oil level rod. | 38 | Shift rail. | 71 | Washer. |
| 2 | Handle. | 39 | Spring. | 72 | Bevel pinion shaft bearing, front. |
| 3 | Lever with handle. | 40 | Gear shifter rail | 73 | Bearing cage, front. |
| 4 | Washer. | | poppet ball. | 74 | Shim, heavy. |
| 5 | Key (Woodruff No. 9). | 41 | Bushing. | 75 | Shim, medium. |
| 6 | Seal. | 42 | Gear (42 teeth). | 76 | Shim, light. |
| 8 | Housing. | 43 | Gear (33 and 44 teeth). | 77 | Spacer, front. |
| 9 | Gasket. | 44 | Gear (27 teeth). | 78 | Gear (47 teeth). |
| 10 | Second and third shift rail. | 45 | Retainer, rear. | 79 | Bushing. |
| 11 | Lever ball. | 46 | Bearing. | 80 | Sleeve. |
| 12 | Lever with ball. | 47 | Ring. | 81 | Key. |
| 13 | Stop, upper. | 48 | Bearing cage, rear. | 82 | Gear (39 teeth). |
| 14 | Spring. | 49 | Guide, rear. | 83 | Spacer. |
| 15 | Stop, lower. | 50 | Low and reverse shift rail. | 84 | Gear (43 and 49 teeth). |
| 16 | Shield. | 51 | Lock. | 85 | Retainer, rear. |
| 17 | Rivet, 3/16 x 1-1/4". | 52 | Retainer. | 86 | Bearing. |
| 19 | Shaft, small. | 53 | Gasket. | 87 | Pinion and shaft (with drive bevel gear). |
| 20 | Shaft, large. | 54 | Pin. | 88 | Bearing cage, rear. |
| 21 | Plug. | 55 | Stud. | 89 | Gear (40 teeth). |
| 22 | Nut. | 56 | Bearing. | 90 | Swivel housing shield bushing. |
| 23 | Lock. | 57 | Hi-lo range idler bearing retainer bolt. | 91 | Reverse gear spacer. |
| 24 | Flange. | 58 | Hi-lo idler gear (23 and 36 teeth). | 93 | Gear shifter rail guide front bolt lock, left hand. |
| 25 | Retainer, front. | 59 | Bearing. | 94 | Gear shifter boot. |
| 26 | Oil seal. | 60 | Bearing retainer, rear. | 95 | Gear shifter boot clamp. |
| 27 | Gasket. | 61 | Idler shaft. | 96 | Hi-lo gear shifter arm. |
| 28 | Bearing, front. | 63 | Oil scoop. | 97 | Hi-lo gear shifter arm shaft. |
| 29 | Spacer. | 64 | Bolt. | 98 | Hi-lo gear shifter arm key. |
| 30 | Cover. | 65 | Bearing. | 99 | Hi-lo gear shifter arm shaft plug. |
| 31 | Gasket. | 66 | Reverse idler gear (31 and 38 teeth). | | |
| 32 | Bearing, rear. | 67 | Bearing. | | |
| 33 | Shaft and gear (29 teeth) | 68 | Washer. | | |
| 34 | Bearing. | 69 | Retainer, front. | | |
| 35 | Spline shaft. | 70 | Gasket. | | |
| 36 | Guide, front. | | | | |
| 37 | Lock, right hand. | | | | |

REPAIR SECTION

TRANSMISSION - Continued

Preparation for Removal of the Transmission - Continued

Remove the two small inspection covers to take out the bolts which hold the steering clutch grease tubes. Remove the springs, capscrews, and bolts from the steering clutch release levers. Then remove the capscrews from the steering clutch release-fork bearing retainer. Lift the levers and the retainer off the tractor.

Take out the capscrews holding the shifter housing (8) to the main frame cover. Lift the housing assembly with the gasket (9) from the cover. Three dowel pins line up the cover on the main frame and are removed with the aid of a nut on their threaded top. When the pins are out, the main frame cover can be lifted off. If the steering clutch release-fork bearing cages stick in the cover they can be tapped out of place and set back on the release forks.

The engine clutch must be removed before the transmission is removed. This is covered in Section 4.

The rear power take off is removed as described in Section 8.

Removal and Disassembly of the Transmission

Drain the oil from the transmission.

The transmission front cover (30) *Illust. 1*, is removed through the engine clutch compartment. Bend back lock (23) and remove the special nut (22) in the end of the transmission drive shaft (33). Slide the flange (24) from the shaft (33).

Remove the capscrews from around the outside edge of the front end cover.

The bearing retainer (69), for the bevel gear and pinion shaft (87), comes out after removing the capscrews. Then take the capscrews from the bearing retainer washer (71) for the bevel gear and pinion shaft. The retainer (52) for the idler shaft (61) should then be removed. Three dowel pins (54) in the cover (30) have threaded heads for easy removal. Assemble three puller capscrews to the tapped holes in the cover (30). Run them up evenly and lift out the cover assembly (25) to (34) and (72) to (76). The gasket (31) will ordinarily stick to the cover.

To disassemble the drive shaft (53) from the cover, remove the bearing retainer (25). Use a babbitt hammer and drive the shaft (53) to the rear of the cover. Bearings (28) and (32) and the spacer (29) can then be removed from the cover. The bearing cage (73) for the bevel gear and pinion shaft (87) can then be taken out of the cover. Shims (74), (75), and (76) fit between this bearing cage and the cover, and are used for obtaining the proper tooth setting of the pinion shaft with the ring gear. Bearing (72) can then be removed from the cage (73).

With the cover (30) removed, the front spacer (77) can be lifted off the pinion shaft (87). The gear (78) can also be slid off sleeve (80).

Then remove the capscrews from the rear bearing cage (48). The upper spline shaft (35) with gears (42), (43), and (44), and the bearing (46), can then be pulled out as an assembly. The gears can then be slid from the shaft. Removal of the snap ring (47) permits bearing (46) and the rear retainer (45) to be removed from the shaft. The bushing (41) can be removed if necessary for replacement.

REPAIR SECTION

TRANSMISSION - Continued

Removal and Disassembly of the Transmission - Continued

The idler shaft assembly (61) comes out easy. Remove the nut, bolt, and the rear bearing retainer (60). Push the Hi-Lo gear (58) to the rear. Pry behind the reverse idler gear (66) and the entire assembly can be moved forward out of the main frame. The Hi-Lo gear can then be removed from the idler shaft. The bearings (56) and (59) can be removed from the gear if they are to be replaced.

Remove bolt (64) from the oil scoop (65) and pull the assembly (63) and (68) from the shaft. This will free bearings (65) and (67). The bevel gear and pinion shaft (87) can be removed after taking out the capscrews in the rear bearing cage (88). The sleeve (80) can be pulled off the shaft. Gears are keyed and pressed on the shaft and can be removed with the aid of an arbor press. The bearing (86), retainer (85), and the bearing cage (88) will then come off. The spacer (83) is used between the gears (82) and (84). The spacer (91) fits between the gear (89) and the bearing (86).

Shifter gears (42), (43), and (44) operating on the upper spline shaft (35) should be free enough to slide along the shaft but should not have any perceptible play in the direction of rotation. A good fit between the spline of the gears and that of the shaft is important.

Shifter forks attached to the shifter housing (8) can be removed for replacement. This can be done by removing bolts from the shifter rail guides (36) and (49). Both poppets and springs (40) and (39) are freed from the housing (8). The Hi-Lo shifter lever shaft assembly can be removed by taking out the bolt in the lever, pulling off the lever and pushing the shaft into the housing (8). Replace the seal (6). The lever (12) can be removed by taking plugs (21) from the housing (8) and pushing the pin (19) out of the housing.

Reassembly and Replacement of the Transmission

Reassembly and replacement of the transmission shafts and gears can be accomplished by reversing the disassembly procedure. Use all new gaskets and oil seals when doing so. Thoroughly clean the assembly and the case before replacing the main frame cover. Refer to the "Service Chart", Section 14, for the relative positions of the gears.

Replace the oil seal (26), *Illust. 1* when reassembling, being sure to have the lip of the leather seal facing the transmission gears.

Replacement bushing (79) for the gear (78) is furnished reamed to size and need only be pressed into place. The inside diameter of the bushing is 3.523" to 3.527", giving a .003" to .008" clearance. The bushing (41) can be removed for replacement. This is furnished to size and need only be pressed into place. The bushing diameter is 1.640" to 1.642".

When replacing the idler shaft (61), be sure that the tang of washer (68) enters the small hole in the main frame. The bevel gear and pinion shaft (87) are properly located in the main frame from front to rear when a 3/8" (.625") gage will slide free between the end of the pinion and the ring gear hub. Shims (74), (75), and (76) are used to obtain this setting. Remove the shims between the bearing cage (73) and the front end cover (30) to reduce the gap between the end of the pinion and the ring gear hub.

After properly setting the pinion, draw all the capscrews tight and recheck. Then check the gears for backlash and adjust them as outlined under the heading "Drive Bevel Gear", Section 5.

Replace all other items previously removed.

REPAIR SECTION

MEMORANDA

REPAIR SECTION

TOLERANCES AND CLEARANCES

NOTE: All tolerances and clearances not found in the Service Charts will be found in the text under the various headings.

OIL SEALS

NOTE: Whenever an oil seal is removed from the tractor, always replace it with a new seal.

When installing new oil seals, check to see that the leather is pliable and the edges are in good condition to assure a tight fit, preventing oil leakage. Inspect the metal surfaces in contact with the oil seal to make sure they are smooth; roughness will cause rapid wear of the seal and consequent oil leakage.



TracTractor Model TD-18

SPARE PARTS CATALOG

The major units of the tractor are arranged alphabetically, in sections, in this parts list and are numbered consecutively, as shown at the right.

Each section has a black tab which lines up with the corresponding section at the right. The black tabs are quickly located by bending this book back.

The contents of each section can be determined at a glance by referring to the index on the other side of this page.

**CONTROLS
AND DASH**

1

COOLING SYSTEM

2

**ELECTRICAL
AND MAGNETO**

3

ENGINE

4

ENGINE CLUTCH

5

FINAL DRIVE

6

FRAME

7

FUEL SYSTEM

8

POWER TAKE-OFF

9

**SEAT AND
FENDERS**

10

**STARTING
MECHANISM**

11

**STEERING
MECHANISM**

12

TRACK

13

TRANSMISSION

14

MISCELLANEOUS

15

SPARE PARTS CATALOG

CONTENTS

CONTROLS AND DASH

| | |
|----------------------|---|
| Control levers | 1 |
| Indicators..... | 1 |

COOLING SYSTEM

| | |
|-------------------------------|------|
| Fan..... | 1 |
| Fan belt idler..... | 2 |
| Radiator and connections..... | 4, 5 |
| Thermostat..... | 3 |
| Water pump..... | 1 |

ELECTRICAL AND MAGNETO

| | |
|---|--------|
| Batteries..... | 13 |
| Electric starting and lighting unit..... | 10, 11 |
| Generator..... | 10 |
| Head lamp (detail parts)..... | 12 |
| Light switch (detail parts)..... | 11 |
| Magneto..... | 1 to 5 |
| Magneto drive..... | 6 |
| Rear lamp (detail parts)..... | 12 |
| Spark plug cables..... | 7 |
| Starting motor..... | 10 |
| Wiring diagram of starting and lighting attachment..... | 8, 9 |

ENGINE

| | |
|------------------------------------|----------|
| Air cleaner and connections..... | 1 |
| Camshaft..... | 6 to 8 |
| Crankcase..... | 2 to 4 |
| Crankcase guard..... | 5 |
| Crankcase oil pan..... | 14, 15 |
| Crankshaft..... | 10 to 13 |
| Cylinder head..... | 6 to 8 |
| Cylinder sleeves..... | 10 to 13 |
| Exhaust muffler..... | 18 |
| Flywheel..... | 10 to 13 |
| Front pull hook..... | 3 |
| Fuel oil filter..... | 9 |
| Lubricating oil filter..... | 9 |
| Lubricating oil pump..... | 14, 15 |
| Manifolds, intake and exhaust..... | 16, 17 |
| Pistons..... | 10 to 13 |
| Spark plug..... | 6 to 8 |
| Starting crank..... | 2 to 4 |
| Valves..... | 6 to 8 |

ENGINE CLUTCH

| | |
|------------------------------------|--------|
| Engine clutch and connections..... | 1 to 4 |
| Engine clutch operating lever..... | 1 to 4 |

FINAL DRIVE

| | |
|------------------------------|--------|
| Drive bevel gear..... | 1 |
| Sprocket drive assembly..... | 2 to 5 |

FRAME

| | |
|------------------------------|------|
| Diagonal brace..... | 8 |
| Drawbar and brackets..... | 9 |
| Equalizer spring..... | 6, 7 |
| Main frame..... | 1 |
| Side channels..... | 4, 5 |
| Track frame and springs..... | 2, 3 |
| Track frame guide..... | 4, 5 |

(Continued on next page.)

SPARE PARTS CATALOG

FUEL SYSTEM

Page No.

| | |
|-------------------------------------|----------|
| Carburetor..... | 4 to 6 |
| Fuel piping diagram..... | 2, 3 |
| Fuel tank..... | 2, 3 |
| Gasoline tank..... | 2, 3 |
| Gasoline strainer..... | 7 |
| Injection nozzle and pipes..... | 8, 9 |
| Injection pump and connections..... | 8, 9 |
| Injection pump (detail parts)..... | 10 to 17 |
| Primer and connections..... | 4 to 6 |
| Water trap..... | 7 |

POWER TAKE-OFF

| | |
|---|---|
| Front power take-off coupling unit..... | 1 |
|---|---|

SEAT AND FENDERS

| | |
|--------------------|---|
| Fenders..... | 1 |
| Seat..... | 1 |
| Seat cushions..... | 1 |

STARTING MECHANISM

| | |
|---------------------------------------|------|
| Cross shaft and governor control..... | 1 |
| Engine control and connections..... | 4 |
| Starting valves and shaft..... | 2, 3 |

STEERING MECHANISM

| | |
|--|------|
| Steering brakes and controls..... | 6, 7 |
| Steering clutch..... | 2, 3 |
| Steering clutch and release mechanism..... | 1 |
| Steering clutch operating levers..... | 4, 5 |

TRACK

| | |
|---------------------------------------|---|
| Front idler..... | 4 |
| Front idler shield attachment..... | 5 |
| Sprocket rock deflector..... | 5 |
| Track idler..... | 3 |
| Track link pin and shoe assembly..... | 1 |
| Track roller assembly..... | 2 |

TRANSMISSION

| | |
|--------------------------|--------|
| Gear shifter lever..... | 1 |
| Hi-Lo shifter lever..... | 1 |
| Oil level rod..... | 1 |
| Transmission..... | 1 to 3 |

MISCELLANEOUS

| | |
|--|------|
| Gasket packages..... | 3 |
| Head lamp brush guards..... | 1 |
| Hood..... | 2 |
| Hose assembly and coupler for bucket lubricator..... | 6 |
| Lincoln bucket type lubricator..... | 4, 5 |
| Lincoln hand type lubricator..... | 7 |
| Lubrication guide kit..... | 7 |
| Radiator guard..... | 1 |
| Tools and tool box..... | 3 |

PREPARATION OF REQUISITIONS

SAMPLE COPY FOR USE IN THE PREPARATION OF REQUISITIONS

Revisions in OMC Form 400 for requisitioning spare parts are confined to new column headings. Until new forms are available all organizations are to continue using the present form and either type or write in corrections indicated in column headings.

Under revised heading "Nomenclature and Unit" list the article and the unit (as for each lb for pound, etc.). Under heading "Authorized or Maximum Level" list the authorized depot stock levels or organizational allowances given in Part III of the Corps of Engineers Supply Catalog. The total number on hand for each item is listed under "On Hand." In column

headed "Due In" enter the total quantity previously requisitioned but not delivered. For "Initial" and "Replenishment" requisitions, the sum of "Required," "Due In," and "On Hand" should equal the "Authorized or Maximum Level."

On this page is shown a sample requisition on OMC Form No. 400 which conforms to the latest revisions. The marginal notes give instructions for preparing a requisition for spare parts for Engineer equipment. Additional information on this subject is contained in section AA-1 of Part III Engineer Supply Catalog, available from the Engineer Field Maintenance Office, P. O. Box 1679, Columbus, Ohio.

- State PERIOD designation by use of one of the following terms:
- (1) "INITIAL"—first requisition of authorized allowances.
 - (2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.
 - (3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.

Type "SPARE PARTS" in upper right hand corner of requisition.

Give complete shipping instructions. Special instructions for packing, marking, routing, etc., should be given at the end of the requisition.

State proper nomenclature of machine, and make, model, serial number and registration number.

Prepare a separate requisition for each different machine.

State basis or authority and date delivery is required, immediately below description of machine.

Double space between items.

Group parts required under group headings as shown in manufacturers' parts catalogs (Technical Manuals).

State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.

| WAR DEPARTMENT G. M. C. Form No. 400 Revised April 6, 1943 | | (SAMPLE) REQUISITION | | SPARE PARTS | | |
|---|--|-----------------------------|--|-------------|----------|----------|
| To: <u>Engineer Supply Officer,</u> | No. of Sheets <u>1</u> | Sheet No. <u>1</u> | | | | |
| <u>Columbus Army Service Forces Depot, COLUMBUS, OHIO.</u> | Date <u>July 5, 1943</u> | Period <u>Replenishment</u> | | | | |
| Requisition No. <u>2-571-1-44</u> | | | | | | |
| SHIP TO: <u>Engineer Property Officer, Pine Camp, New York.</u> | | | | | | |
| <u>MAILED FOR: Supply Officer, 802nd Engineer Battalion, Pine Camp, N. Y.</u> | | | | | | |
| Requisitioned By (show Signature, Rank, Organization, Destination. If different from "SHIP TO" include address): <u>Robert E. Roe</u> Robert E. Roe. Major, G. E. Engineer Property Officer | | | Approved: For the Commanding Officer: <u>John E. Doe</u> John E. Doe, Col., G. E. Executive Officer. | | | |
| MFG. No. | NOMENCLATURE AND UNIT | AUTHOR. PARTIAL LEVEL | ON HAND | DUE IN | REQUIRED | APPROVED |
| | <u>PARTS FOR TRACTOR, CRAWLER TYPE DIESEL,</u> <u>INTERNATIONAL HARVESTER MODEL TD-16</u> | | | | | |
| | Basis: Repair of Disabled Equipment. Delivery is requested by July 30, 1943. | | | | | |
| | <u>ENGINE GROUP</u> | | | | | |
| 32288 DAX | Crankshaft with nut | 0 | 0 | 0 | 1 | |
| 32809 D | Oil seal gasket | 0 | 0 | 0 | 1 | |
| | <u>FINAL DRIVE GROUP</u> | | | | | |
| 64497 D | Sprocket drive pinion (15 teeth) | 0 | 0 | 0 | 1 | |
| | <u>STEERING MECHANISM GROUP</u> | | | | | |
| 8679 DA | Release lever | 0 | 0 | 0 | 1 | |
| 63226 D | Steering clutch operating rod yoke | 0 | 0 | 0 | 1 | |
| | <u>COMPON SUPPLIES</u> | | | | | |
| ..... | Box. jam nut, 1/2" N.F. | 0 | 0 | 0 | 0 | |

* Nonexpendable items such as tools must be accounted for, when requisitioned, by a statement that they have been placed on REPORT OF SURVEY or STATEMENT OF CHARGES.

Emergency requisitions sent by telephone, telegraph or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."

PREPARATION OF REQUISITIONS

Sample Copy for Use in the Preparation of Requisitions

A sample requisition in the correct form for submission by the Engineer Property Officer is shown on the opposite page.

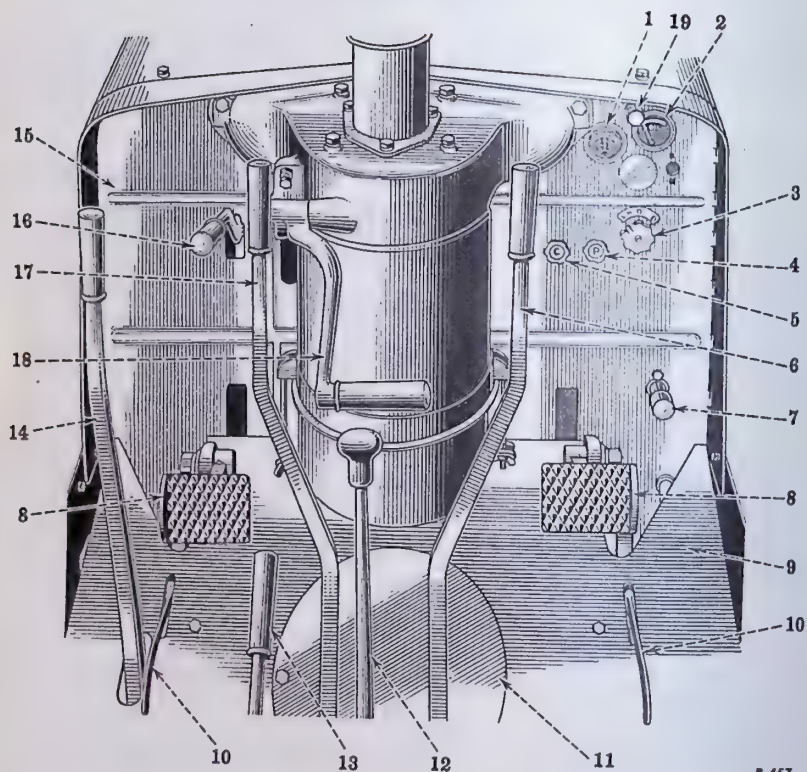
THIS SHALL BE FOLLOWED IN MAKING OUT REQUISITIONS

In order to eliminate duplication of work, Property Officers may authorize organizations to prepare requisitions in final form, leaving requisition number space blank for completion by Property Officer.

THE FOLLOWING RULES WILL BE OBSERVED CARE- FULLY IN PREPARING REQUISITIONS FOR SPARE PARTS:

- aa. Prepare a separate requisition for each different machine.
- bb. Type "SPARE PARTS" in upper right hand corner of requisition form.
- cc. State PERIOD designation by use of one of the following terms:
 - (1) "INITIAL"—first requisition of authorized allowances.
 - (2) "REPLENISH"—subsequent requisitions to maintain authorized allowances.
 - (3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.
- cd. Give complete shipping instructions.
- ee. State proper nomenclature of machine, and make, model, serial number and registration number.
- ff. State basis or authority and date delivery is required, immediately below description of machine.
- gg. Group parts required under group headings as shown in manufacturers' parts catalog.
- hh. State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.
- ii. Double space between items.
- jj. Emergency requisitions sent by telephone, telegraph, or radio, must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."
- kk. Nonexpendable items must be accounted for.

CONTROLS AND DASH



B-457

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

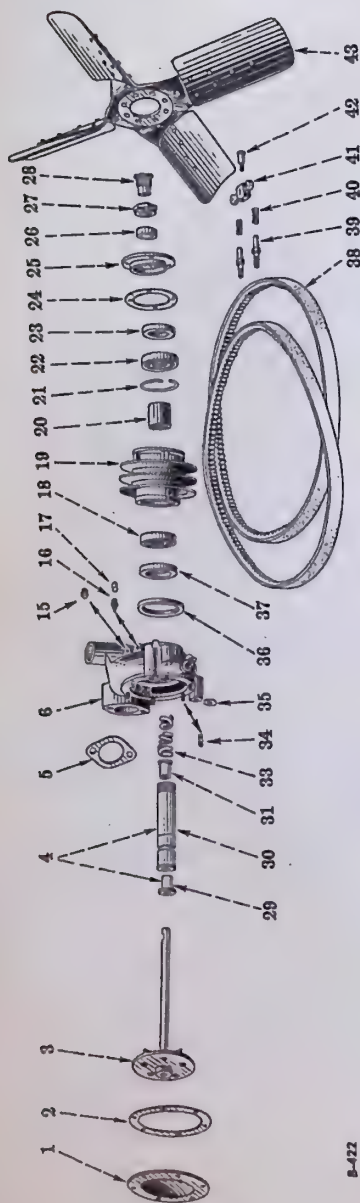
CONTROLS AND DASH - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 1 | 42383 D | Ammeter (A-C Spark Plug Co. No. AM-1801) . | 1 | .250 |
| 2 | 41934 DB | Oil pressure indicator with clamp (see list below) | 1 | .500 |
| 3 | ..... | Light switch (see Section 3, page 11) . . . | ... | ..... |
| 4 | 58202 D | Primer control rod and button (see Section 8, pages 4 and 5 also) | 1 | .250 |
| ... | ..... | Cotter, 1/16 x 3/8" | 1 | .000 |
| 5 | 58204 D | Choke control rod and button | 1 | .312 |
| ... | ..... | Cotter, 1/16 x 3/8" | 1 | .000 |
| 6 | ..... | Steering clutch lever, right hand (see Section 12, page 5) . . . . . | ... | ..... |
| 7 | ..... | Starting switch (see Section 3, page 10) . | ... | ..... |
| 8 | ..... | Brake pedal pad (see Section 12, page 7) . | ... | ..... |
| 9 | 42553 DXA | Engine clutch cover | 1 | 25.000 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 10 | .052 |
| ... | Q 1920 | Lock washer, 3/8" | 10 | .005 |
| 10 | ..... | Brake pedal lock (see Section 12, page 7) . | ... | ..... |
| 11 | 42547 D | Engine clutch inspection cover | 1 | 4.312 |
| ... | Q 4016 | Cap screw, 3/8 x 5/8" N.F. | 3 | .048 |
| ... | Q 1920 | Lock washer, 3/8" | 3 | .005 |
| 12 | ..... | Gear shift lever (see Section 14, page 1) . | ... | ..... |
| 13 | ..... | Hi-Low shifter lever (see Section 14, page 1) | ... | ..... |
| ... | ..... | Cap screw, 1/2 x 1-5/8" N.C. | 1 | .134 |
| ... | Q 1922 | Lock washer, 1/2" | 1 | .013 |
| 14 | ..... | Engine clutch lever (see Section 5, page 4) | ... | ..... |
| ... | Q 1877 | Cap screw, 5/8 x 2-1/2" N.F. | 1 | .30? |
| ... | Q 1911 | Hex. nut, 5/8" N.F. | 1 | .12? |
| ... | Q 1925 | Lock washer, 5/8" | 1 | .013 |
| 15 | 58199 DA | Dash and Cowl assembly | 1 | 53.000 |
| ... | Q 1856 | Cap screw, 1/2" N.C. x 2" | 2 | ..... |
| ... | Q 1922 | Lock washer, 1/2" | 2 | ..... |
| 16 | ..... | Compression release lever (see Section 11, page 4) . . . . . | ... | ..... |
| 17 | ..... | Steering clutch lever, left hand (see Section 12, page 5) . . . . . | ... | ..... |
| 18 | ..... | Governor control lever (see Section 11, page 4) . . . . . | ... | ..... |
| ... | 51502 D | Dash spacer | 2 | .093 |
| 19 | ..... | Dash lamp (see Section 3, page 10) . . . | ... | ..... |

DETAIL PARTS OF OIL PRESSURE INDICATOR AND CONNECTIONS

| | | | | |
|-----|----------|--|---|-------|
| ... | 16445 D | Oil pressure indicator tube clip felt. . . | 1 | .001 |
| ... | 29898 D | Oil pressure indicator coupling nut (in oil indicator) | 1 | .015 |
| ... | 29898 D | Oil pressure indicator coupling elbow nut. | 1 | .015 |
| ... | 42493 DX | Oil pressure indicator tube coupling elbow (in engine crankcase) | 1 | .093 |
| ... | 59990 DX | Oil pressure indicator tube with nuts (indicator to engine) | 1 | ..... |
| ... | 59991 D | Oil pressure indicator tube clip | 1 | .062 |
| ... | ..... | Round head slotted screw, No. 10 - 24 x 1/2" | 1 | ..... |
| ... | ..... | Hex. nut, No. 10 - 24 | 1 | ..... |
| ... | ..... | Lock washer, No. 10 | 1 | ..... |
| ... | 60805 D | Oil indicator clamp | 1 | .125 |
| ... | 53031 D | Oil indicator clamp lock washer (Shake-proof No. 1112) | 2 | .000 |
| ... | ..... | Hex. nut, No. 12 - 24" N.C. | 2 | ..... |
| ... | 42493 D | Oil pressure gage coupling elbow (in engine crankcase) | 1 | ..... |

FAN AND WATER PUMP



B-422

| Ref. No. | I H C Part No. | Description | No. Used | Weight Lbs. |
|----------|----------------|--|----------|-------------|
| ... | 42686-D | Water pump (includes Ref. Nos. 1 thru 37 and 39 thru 42) | 1 | 29.500 |
| 1 | 32350 D | Pump body cover. | 1 | 1.000 |
| 2 | 32351 D | Pump body cover gasket | 1 | .007 |
| 3 | 5008 DCX | Pump impeller. | 1 | 2.000 |
| 4 | 32353 D | Shaft and sleeve assembly. | 1 | 1.906 |
| 5 | 30824 D | Pump body gasket | 1 | .010 |
| 6 | 5950 DX | Pump body, with studs and pipe plugs | 1 | 14.000 |
| ... | Q 4044 | Cap screw, 1/2 x 3-1/2" N.C. | 1 | .245 |
| ... | Q 1862 | Cap screw, 1/2 x 2-5/4" N.C. | 1 | .203 |
| ... | Q 4043 | Cap screw, 1/2 x 3-1/4" N.C. | 1 | .231 |
| ... | Q 1860 | Cap screw, 1/2 x 2-1/2" N.C. | 1 | .189 |
| ... | ..... | Lock washer, 1/2" | 4 | .013 |
| ... | ..... | Pipe plug, 1/4" | 1 | ..... |
| ... | ..... | Pipe plug, 3/8" | 1 | ..... |
| 15 | Q 3615 | Lubricator (Lincoln No. 5000) | 1 | .015 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

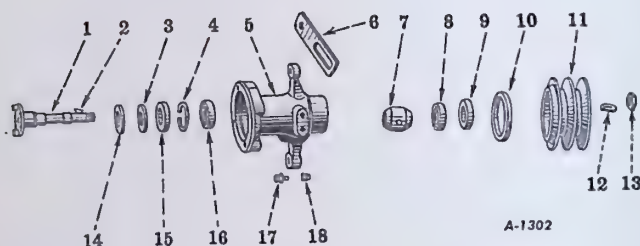
FAN AND WATER PUMP - Continued

| | | | | |
|----|-----------|---|---|-------|
| 16 | QA 3628 | Lubricator with cap (Lincoln No. 5575) | 1 | ..... |
| 17 | Q 3659 | Lubricator cap (Lincoln No. 5560) | 1 | ..... |
| 18 | { 20308 D | Pump ball bearing (New Departure No. 3207) (optional) | 2 | ..... |
| 19 | { ST 205A | Pump ball bearing (IHC) (optional) | 2 | ..... |
| 20 | 5010 DAX | Pump pulley with studs and oil seals | 1 | 4.000 |
| 21 | 32356 D | Pump bearing spacer | 1 | .468 |
| 22 | 27654 D | Pump bearing retainer ring | 1 | .125 |
| 23 | { 20308 D | Pump ball bearing (New Departure No. 3207) (optional) | 2 | .687 |
| 24 | { ST 205A | Pump ball bearing (IHC) (optional) | 2 | .687 |
| 25 | 20289 D | Oil seal | 1 | .203 |
| 26 | 32624 D | Bearing retainer gasket | 1 | .007 |
| 27 | 5009 DX | Bearing retainer with oil seal | 1 | .062 |
| 28 | 20293 L | Bearing lock sleeve | 1 | 1.750 |
| 29 | 34315 H | Fan pulley bearing clamp nut | 1 | .128 |
| 30 | 20296 D | Pump packing gland | 1 | .265 |
| 31 | 20303 D | Pump shaft thrust bushing | 1 | .125 |
| 32 | 32354 D | Pump shaft sleeve | 1 | 1.875 |
| 33 | 24017 D | Pump shaft bushing | 1 | .062 |
| 34 | 50790 D | Pump packing | 1 | .812 |
| 35 | 32352 D | Pump body cover stud | 6 | .062 |
| 36 | Q 1903 | Hex. nut, 5/16" N.F. | 6 | .015 |
| 37 | 32349 D | Lock washer, 5/16" | 6 | .003 |
| 38 | 20300 D | Pump body spacer | 2 | .012 |
| 39 | 20290 D | Pump felt washer | 1 | .203 |
| 40 | 42937 DX | Oil seal | 1 | 2.062 |
| 41 | 34321 HA | Fan belt (pair) | 1 | .087 |
| 42 | G 2792 | Pump driving stud | 2 | ..... |
| 43 | 20585 D | Lock washer, 3/8" | 2 | .062 |
| 44 | 20586 D | Pump drive spring | 1 | .312 |
| 45 | Q 1903 | Pump driver | 1 | .050 |
| 46 | 32357 D | Driver pin | 1 | .015 |
| 47 | 1802 | Hex. nut, 5/16" N.F. | 1 | .003 |
| 48 | ..... | Lock washer, 5/16" | 1 | 9.750 |
| 49 | ..... | Fan assembly | 1 | .052 |
| 50 | ..... | Cap screw, 3/8 x 1" N.C. | 2 | ..... |
| 51 | ..... | Lock washer, 3/8" | 2 | ..... |

As req'd

SPARE PARTS CATALOG

FAN BELT IDLER

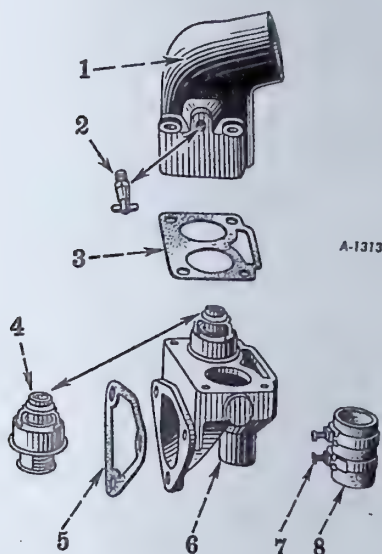


| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| ... | 63007 D | Fan belt idler, includes Ref. Nos. 1 through 5 and 7 through 18. | 1 | 10.875 |
| 1 | 42938 D | Fan belt idler shaft | 1 | .843 |
| 2 | 13085 D | Fan belt idler pulley key (Woodruff No. 7) | 1 | .006 |
| 3 | 42941 D | Idler shaft felt | 1 | .005 |
| 4 | 42939 D | Idler bearing lock ring. | 1 | .062 |
| 5 | 5987 DX | Idler bracket with oil seal and pipe plug. | 1 | 5.250 |
| ... | Q 1865 | Cap screw, 1/2 x 4-1/2" N.F. | 1 | .301 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 1 | .069 |
| ... | ..... | Lock washer, 1/2" | 1 | .013 |
| 6 | 32523 D | Idler pulley brace | 1 | .312 |
| ... | Q 1802 | Cap screw, 3/8" x 1" N.C. | 1 | .052 |
| ... | Q 1803 | Cap screw, 3/8 x 1-1/4" N.F. | 1 | .060 |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 1 | .031 |
| ... | ..... | Lock washer, 3/8" | 1 | .005 |
| ... | ..... | Washer, 13/32" I.D. x 3/4" O.D. x 16 ga. | 2 | ..... |
| 7 | 5988 D | Idler gearing spacer | 1 | .250 |
| 8 | 1266 C | Idler bearing (New Departure No. 3203) . . | 1 | .125 |
| 9 | 42940 D | Idler oil seal | 1 | .125 |
| 10 | W 16210 | Idler pulley felt. | 1 | .012 |
| 11 | 5989 D | Idler pulley | 1 | 3.750 |
| 12 | ..... | Lock washer, 5/8" | 1 | .013 |
| 13 | ..... | Hex. jam nut, 5/8" N.F. | 1 | .078 |
| 14 | 42942 D | Idler shaft felt retainer. | 1 | .031 |
| 15 | 42940 D | Idler oil seal | 1 | .125 |
| 16 | 8522 T | Idler bearing (New Departure No. 3204) (optional). | 1 | .250 |
| 17 | ST 207 | Idler bearing (IHC) (optional) | 1 | .250 |
| 18 | Q 3615 | Lubricator (Lincoln No. 5000). | 1 | .015 |
| 18 | ..... | Plug, 1/8" | 1 | ..... |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

THERMOSTAT



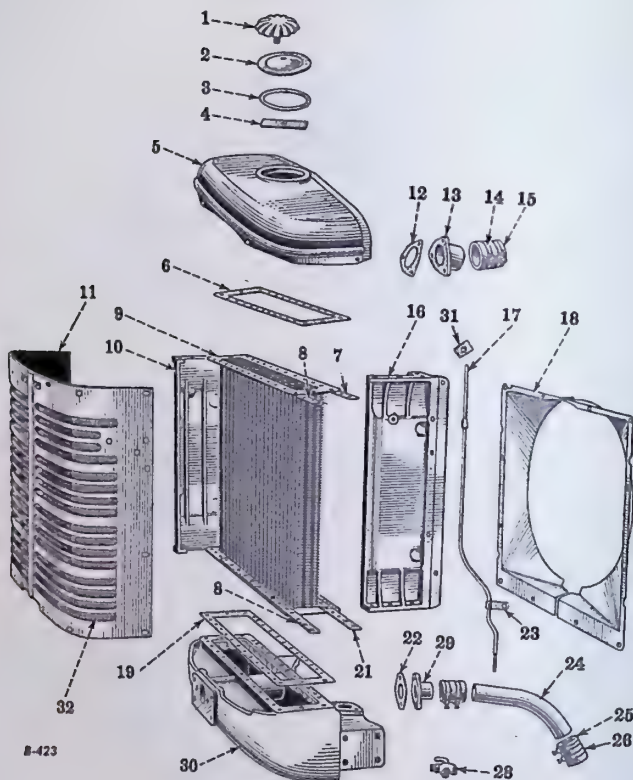
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| 1 | 5952 D | Thermostat housing | 1 | 8.000 |
| ... | Q 1860 | Cap screw, 1/2 x 2-1/2" N.C. | 4 | .189 |
| ... | ..... | Lock washer, 1/2" | 4 | .013 |
| 2 | 9982 T | Vent cock. | 1 | .062 |
| 3 | 42655 D | Thermostat housing gasket. | 1 | .012 |
| 4 | {37634 D | Thermostat (165°-190° F.) (optional) | 2 | .312 |
| ... | {33814 D | Thermostat (165°-190° F.) (optional) | 2 | |
| 5 | 42654 D | Water outlet gasket. | 1 | .012 |
| 6 | 5951 D | Water outlet | 1 | 6.250 |
| ... | Q 1852 | Cap screw, 1/2 x 1-1/2" N.C. | 3 | .134 |
| ... | ..... | Lock washer, 1/2" | 3 | .013 |
| 7 | 91406 HA | Hose clamp | 2 | .068 |
| 8 | 42656 D | Hose, 1-3/4 x 2-3/4" I.D. long | 1 | .125 |

When ordering, always use I H C Part Nos.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

RADIATOR



| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| ... | 42615 DE | Radiator (includes Ref. Nos. 5 thru 10, 16, 17, 19, 21, 23, 24 and 30). | 1 | 518.000 |
| 1 | 42610 D | Handle | 1 | .720 |
| 2 | 5913 D | Cover | 1 | 2.250 |
| 3 | 10429 D | Gasket | 1 | .750 |
| 4 | 42158 D | Clamp | 1 | .812 |
| ... | ... | Brass cotter, 5/32 x 3/4" | 1 | ..... |
| 5 | 5940 DA | Water tank, upper. | 1 | 102.000 |
| 6 | 68072 D | Gasket | 1 | .050 |
| 7 | 42599 D | Core stiffener, upper, rear. | 1 | 1.750 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 10 | .052 |
| ... | ... | Lock washer, 3/8" | 10 | .005 |
| 8 | 42534 D | Core stiffener, front. | 2 | 2.000 |
| ... | ... | Cap screw, 3/8 x 1-1/8" N.C. | 12 | .060 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 12 | .052 |
| ... | ... | Lock washer, 3/8" | 24 | .005 |

(Continued on next page)

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

RADIATOR - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|---|-------------|-------------|
| 9 | 42538 DA | Core | 1 | 87.000 |
| ... | 42589 D | Radiator repair tube | As req'd | .039 |
| 10 | 5945 DA | Core spacer, R.H. | 1 | 25.500 |
| ... | Q 1854 | Cap screw, 1/2 x 1-3/4" N.C. | 2 | .148 |
| ... | Q 1852 | Cap screw, 1/2 x 1-1/2" N.C. | 6 | .134 |
| ... | ... | Lock washer, 1/2" | 8 | .013 |
| 11 | 42603 DA | Grille | 1 | 25.000 |
| ... | Q 4016 | Cap screw, 3/8 x 5/8" N.C. | 16 | .041 |
| ... | ... | Lock washer, 3/8" | 16 | .005 |
| ... | ... | Washer, 13/32" I.D. x 7/8" O.D. x 16 ga. | 16 | ..... |
| 12 | 42536 D | Elbow gasket | 1 | .005 |
| 13 | 5942 D | Inlet elbow. | 1 | 1.500 |
| ... | Q 1804 | Cap screw, 3/8 x 1-1/4" N.C. | 3 | .060 |
| ... | ... | Lock washer, 3/8" | 3 | .005 |
| 14 | 91406 HA | Inlet hose clamp | 2 | .082 |
| 15 | 42612 D | Inlet hose (2-7/8" I.D. x 2-7/8" long) | 1 | .250 |
| 16 | 5944 DA | Core spacer, L.H. | 1 | ..... |
| ... | Q 1854 | Cap screw, 1/2 x 1-3/4" N.C. | 2 | .14 |
| ... | Q 1852 | Cap screw, 1/2 x 1-1/2" N.C. | 6 | .134 |
| ... | ... | Lock washer, 1/2" | 8 | .013 |
| 17 | 42601 DAX | Overflow pipe. | 1 | ..... |
| 18 | 42544 DA | Sheet, L.H. | 1 | 4.000 |
| ... | 42545 DA | Sheet, R.H. | 1 | 4.000 |
| ... | Q 4016 | Cap screw, 3/8 x 5/8" N.C. | 11 | .041 |
| ... | ... | Lock washer, 3/8" | 11 | .005 |
| 19 | 68072 D | Gasket | 1 | .050 |
| 21 | 42600 D | Core stiffener, lower, rear. | 1 | .625 |
| ... | ... | Cap screw, 3/8 x 1-1/8" N.C. | 10 | .060 |
| ... | ... | Lock washer, 3/8" | 10 | .005 |
| 22 | 32181 D | Outlet elbow gasket. | 1 | .005 |
| 23 | 42914 D | Pipe clip. | 1 | .083 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 1 | .045 |
| ... | ... | Lock washer, 3/8" | 1 | .005 |
| 24 | 46677 D | Outlet pipe. | 1 | 2.000 |
| 25 | 42614 D | Outlet hose (2-3/8" I.D. x 2-7/8" long) | 2 | .203 |
| 26 | 91406 HA | Outlet hose clamp. | 4 | .062 |
| 28 | 42605 D | Drain cock | 1 | .361 |
| 29 | 6442 D | Outlet flange. | 1 | 1.250 |
| ... | Q 1806 | Cap screw, 1/2 x 1-1/2" N.C. | 2 | .134 |
| ... | ... | Lock washer, 1/2" | 2 | .013 |
| 30 | 5941 DB | Water tank, lower. | 1 | 185.000 |
| 31 | 52033 D | Overflow pipe gasket | 1 | .001 |
| 32 | 49106 D | Grille screen. | 1 | 1.500 |

When ordering, always use I H C Part Nos.

SPARE PARTS CATALOG

MEMORANDA

SPARE PARTS CATALOG

MAGNETO (F-6)



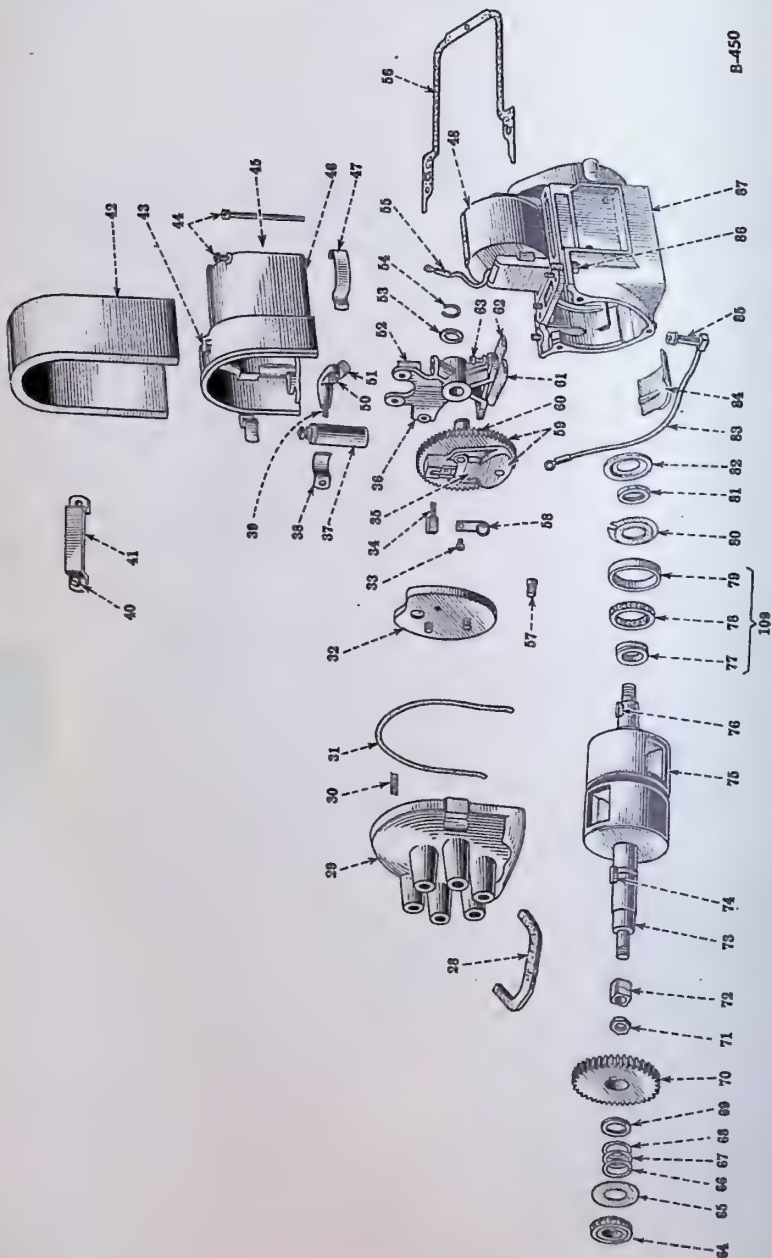
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| ... | 32361 D | Magneto, complete (F-6) (includes parts listed on pages 1 thru 5) | 1 | 13.000 |
| ... | ..... | Cap screw, 3/8 x 1-5/8" N.C. | 4 | .076 |
| ... | ..... | Lock washer, 3/8" | 4 | .005 |
| 1 | E4-267A | Nut | 2 | .006 |
| 2 | E4-271 | Plain washer | 1 | .001 |
| 3 | 30037 D | Bushing | 1 | .002 |
| 4 | 3930 DX | Cover, includes Ref. 10. | 1 | .218 |
| 5 | 32673 D | Link | 1 | .031 |
| 6 | 31135 D | Spring insulator | 1 | .001 |
| 7 | 30036 D | Terminal insulator | 1 | .002 |
| 8 | 30035 D | Spring | 1 | .001 |
| 9 | 30038 D | Screw | 1 | .009 |
| ... | ..... | Lock washer, No. 10 - 1/16 x 3/64" (cad. plated) | 2 | ..... |
| 10 | 21327 D | Packing | 1 | .012 |
| 11 | 21393 D | Screw | 1 | .004 |
| 12 | 21394 D | Washer | 1 | .003 |
| 13 | 21388 DBX1 | Stationary point | 1 | .015 |
| 14 | 21373 DBY1 | Breaker arm assembly | 1 | .031 |
| 15 | 21383 D | Cam felt | 1 | .001 |
| 16 | 21368 DBY6 | Breaker cup, includes Ref. 15 and 23 | 1 | .125 |
| 17 | 21329 DX | Spring post, assembly | 1 | .009 |
| ... | ..... | Lock washer, No. 10 - 1/16 x 3/64" (cad. plated) | 1 | ..... |
| 18 | 2548 DAY | Breaker housing includes Ref. 19, 20, 21, 25, 27. | 1 | .420 |
| 19 | E4-226 | Felt | 1 | .003 |
| 20 | 21330 D | Retainer | 1 | .006 |
| 21 | E4A-352 | Outer bearing race | 1 | .037 |
| 22 | ..... | Lock washer, No. 10 - 1/16 x 3/64" (cad. plated) | 2 | ..... |
| 23 | 21384 DXA | Spring anchor, includes Ref. 15. | 1 | .016 |

(Continued on pages 3 and 4)

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

MAGNETO (F-6) - Continued



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

MAGNETO (F-6) - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|----------|----------------|--|----------|----------|
| 24 | 21441 D | Screw | 1 | .009 | 34 | 21463 DAXA | Brush and spring. . . | 1 | .015 |
| ... | ... | Lock washer, No. 10, 1/64 x 3/4" (cad. plated) | 1 | ... | ... | ... | Fillister head screw (No. 5 - 40 x 3/16" | 1 | ... |
| 25 | 21443 DX | Breaker stop. | 1 | .006 | ... | ... | Lock washer, No. 6 - 1/32 x 1/32" (cad. plated) | 1 | .003 |
| ... | 21444 D | Breaker stop gasket (not seen) | 1 | .001 | 35 | 21460 DY | Distributor bearing, includes Ref. 52, 61, 62 | 1 | .187 |
| ... | ... | Slotted round head screw, No. 5 - 40 x 3/16" | 2 | ... | 36 | 2551 DAY6 | Nut, No. 10 - 32 N.F. (cad. plated) | 1 | .077 |
| 26 | 28856 D | Link post | 1 | .107 | ... | ... | Lock washer, No. 10 - 1/16 x 3/64" (cad. plated) | 1 | ... |
| ... | ... | Lock washer, No. 10, 1/16 x 3/64" (cad. plated) | 1 | ... | 37 | 21409 DB | Clamp | 1 | .017 |
| 27 | E4-295 | Oilier felt (not seen) | 1 | .006 | ... | ... | Lock washer, No. 8 - 3/64 x 3/64" (cad. plated) | 1 | ... |
| ... | E4-216 | Short circuiting spring contact holder | 1 | .003 | 38 | 21422 D | Fillister head slotted screw, No. 8 - 32 x 5/16" | 1 | ... |
| ... | E4A-311 | Breaker assembly, complete | 1 | ... | ... | ... | Spring | 1 | .002 |
| ... | 25796 DA | Seal, lower | 1 | .156 | ... | ... | Screw | 1 | .006 |
| 28 | 21347 DC | Block, includes Ref. 28, 30, 31, 32, 57 | 1 | .002 | 39 | 21366 D | Strap | 2 | .050 |
| 29 | 28656 DZA | Block, includes Ref. 28, 31 | 1 | .750 | 40 | 21324 D | Magnet | 1 | 3.750 |
| 30 | 28656 DYA | Distributor contact spring | 1 | .500 | 41 | 21323 D | Oilier with felt | 1 | .009 |
| 31 | 21348 DB | Seal, upper | 7 | .001 | 42 | 21322 D | Oilier felt (not seen) | 1 | .002 |
| 32 | 28657 DX | Disc and inserts | 1 | .156 | 43 | 21328 DX | Screw, long | 2 | .125 |
| 33 | ... | Screw, No. 5 - 40 x 5/16" | 1 | .002 | 44 | E4A-576 | Oilier | 2 | .006 |
| ... | ... | ... | 1 | ... | 45 | E4-295 | ... | 2 | ... |

(Continued on next page)

SPARE PARTS CATALOG

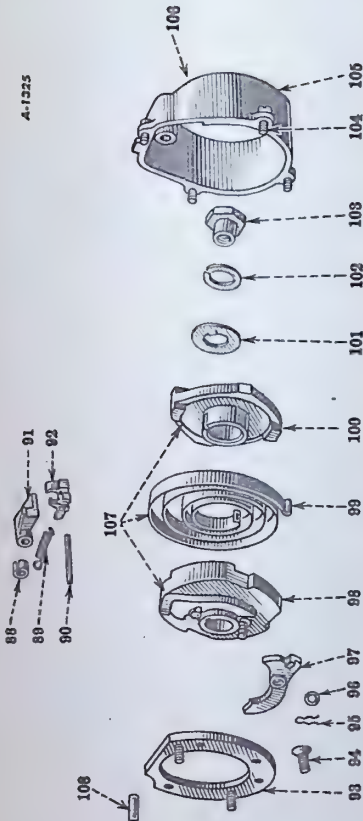
MAGNETO (F-6) - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|-----------------------|---|----------|----------|----------|----------------|--|----------|----------|
| 46 | 2547 DX | Cover, includes Ref. 43, 45 | 1 | .437 | 67 | E4-212 | Shim, medium. | 1 | .002 |
| 47 | 21349 D (21401 DAX | Spring. | 2 | .093 | 68 | E4A-372 | Shim, heavy | 1 | .007 |
| | | Coil with insulators and screws | 1 | .607 | 69 | 21340 D | Spacer. | 1 | .009 |
| 48 | 56F79 DX | Coil and core with insulation | 1 | .795 | 70 | 33138 D | Pinion (40 teeth) | 1 | .250 |
| | | Coil with screws. | 1 | .250 | 71 | 21343 D | Nut | 1 | .003 |
| 50 | 21314 DX | Plain washer. | 2 | .000 | 72 | 21343 D | Cam | 1 | .012 |
| 51 | 38609 DA | Secondary lead-out. | 1 | .031 | 73 | 21342 D | Cam key | 1 | .002 |
| | 48564 D | Fillister head slotted screw, No. 8 - 32 x 5/8" | 1 | | 74 | 4167 T | Key (Woodruff No. 3). | 1 | .004 |
| | | Lock washer, No. 8 - 3/64 x 3/64" | 2 | | 75 | 21333 DX6 | Key (includes Ref. 64 to 78, inclusive) | 1 | 2.500 |
| | | (cad. plated) | | | 76 | 4167 T | Key (Woodruff No. 3). | 1 | .003 |
| 52 | 38041 D | Felt. | 2 | | 77 | E4A-351 | Inner bearing race. | 1 | .025 |
| 53 | 21351 D | Washer. | 1 | .003 | 78 | E4A-353 | Retainer with balls | 1 | .029 |
| 54 | 21352 D | Snap ring | 1 | .001 | 79 | E4A-352 | Outer bearing race. | 1 | .037 |
| 55 | 58243 D | Lead-out tube | 1 | .000 | 80 | 30379 D | Felt retainer | 1 | .009 |
| 56 | 21319 D | Gasket | 1 | .001 | 81 | E4-226 | Felt. | 1 | .003 |
| 57 | 28555 D | Screw | 3 | .006 | 82 | 30378 D | Felt retainer | 1 | .009 |
| 58 | 21464 DX | Contact spring. | 1 | | 83 | 21399 DX | Primary lead-out and terminals. | 1 | .025 |
| 59 | 21469 D | Shaft, gear and distributor | 1 | .312 | 84 | 21331 D | Shield. | 1 | .009 |
| 60 | 21360 DX6 | Shaft and gear. | 1 | .202 | 85 | 21397 D | Screw | 1 | .003 |
| 61 | 21353 D | Shim. | 1 | .001 | | | Special heavy lock washer, No. 8 - 3/32 x 3/64" (cad. plated). | 1 | .012 |
| 62 | 21466 D | Shim. | 1 | .012 | 86 | E4A-358 | Screw | 2 | |
| 63 | E4A-358 | Screw | 2 | .012 | | | Lock washer, No. 10 - 1/16 x 3/64" (cad. plated) | 2 | |
| | | Lock washer, No. 10 - 1/16 x 3/64" | 2 | | 87 | 2546 DBYb | Frame, includes Ref. 56, 79, 80, 81, 82 | 1 | 2.750 |
| 64 | E4A-353 | Retainer with balls | 1 | .029 | | | Flat head slotted screw, No. 8 - 32 x 11/16" | 2 | .002 |
| 65 | E4A-324 | Oil flinger | 1 | .031 | 88 | 24616 DA | Pawl spacer | 1 | |
| 66 | E4A-305 | Shim, light | 1 | .003 | | | | | |

(Continued on next page)

SPARE PARTS CATALOG

MAGNETO (F-6) - Continued

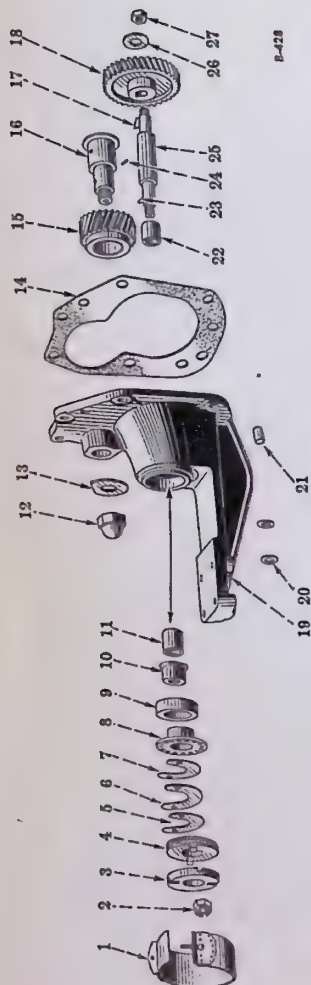


| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|--|----------|----------|
| 89 | 24612 D | Spring. | 1 | .012 | ... | ... | Special light lock washer, 1/2" x 5/8" (cad. plated). | 1 | .... |
| 90 | 24613 D | Pin. | 1 | .006 | 104 | ... | Screw, No. 8 - 32 x 5/8" (cad. plated). | 4 | .004 |
| 91 | 32671 D | Pawl. | 1 | .047 | 105 | 5086 DX | Coupling cover with oiler. | 1 | .218 |
| 92 | 24611 D | Latch. | 1 | .012 | ... | ... | Fillister head screw, No. 8 - 32 x 5/8" (cad. plated). | 4 | .... |
| 93 | 33150 D | Frame ring. | 1 | .156 | 106 | 27311 D | Lock washer, No. 8 (cad. plated). | 4 | .... |
| 94 | ..... | Flat head slotted screw, No. 10 - 32 x 9/16" | 3 | .... | 107 | 36246 D | Oiler. | 1 | .006 |
| 95 | 30114 D | Snap ring. | 2 | .001 | 108 | 24609 D | Impulse coupling rotating member, includes Ref. 95 to 100 inclusive. | 1 | .890 |
| 96 | 24610 D | Washer. | 2 | .002 | 109 | E4-294 | Pin. | 1 | .035 |
| 97 | 32711 D | Engaging pawl. | 2 | .034 | ... | ... | Rotor shaft bearing, includes Ref. 77, 78, 79. | 2 | .081 |
| 98 | 32603 DAX | Magneto member with pins. | 1 | .343 | ... | ... | ... | ... | ... |
| 99 | 32712 D | Magneto member, includes Ref. 95, 96, 97. | 1 | .468 | ... | ... | ... | ... | ... |
| 100 | 24605 D | Spring. | 1 | .033 | ... | ... | ... | ... | ... |
| 101 | 24602 DA | Cam member. | 1 | .250 | ... | ... | ... | ... | ... |
| 102 | 24603 D | Washer. | 1 | .031 | ... | ... | ... | ... | ... |
| 103 | ..... | Lock washer, 1/2" Nut. | 1 | .013 | ... | ... | ... | ... | ... |
| 104 | 24604 D | Nut. | 1 | .043 | ... | ... | ... | ... | ... |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

MAGNETO BRACKET AND DRIVE



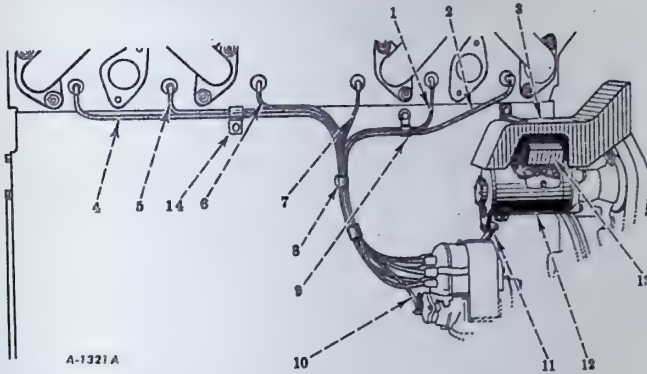
B-428

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|--|----------|----------|
| 1 | 28388 DA | Cover | 1 | .187 | 18 | 32500 DA | Gear (36 teeth) | 1 | 1.500 |
| 2 | 35719 D | Slotted fillister head screw, No. 10 - 24 x 7/8" | 1 | ..... | 19 | 5947 DX | Bracket with dowels, bushings and pipe plugs | 1 | 17.500 |
| 3 | 12740 D | Nut, 1/2" N.F. | 1 | ..... | ... | Q 1855 | Pipe plug, 1/8" | 2 | ..... |
| 4 | 10481 D | Spacer | 1 | .093 | ... | Q 1857 | Cap screw, 1/2 x 2-1/4" N.F. | 4 | ..... |
| 5 | 10481 D | Block (male) | 1 | .012 | ... | Q 1857 | Cap screw, 1/2 x 2-1/4" N.F. | 1 | ..... |
| 6 | 10482 D | Shim (medium) | 1 | .040 | ... | Q 1922 | Cap screw, 1/2 x 1-1/8" N.F. | 1 | ..... |
| 7 | 10553 D | Shim (heavy) | 1 | .006 | ... | Q 1909 | Lock washer, 1/2" | 4 | .013 |
| 8 | 22716 D | Shim (light) | 1 | ..... | ... | Q 2332 D | Hex. nut, 1/2" N.F. | 2 | ..... |
| 9 | 33788 D | Coupling | 2 | .002 | 20 | 32504 D | Gasket | 2 | .031 |
| 10 | 32503 D | Cap screw, 1/4 x 7/16" N.F. | 2 | .156 | 21 | 32506 D | Dowel | 2 | .047 |
| 11 | 32506 D | Lock washer, 1/4" | 1 | .187 | 22 | 32506 D | Bushing | 2 | .003 |
| 12 | 32506 D | Oil seal | 1 | .047 | 23 | 4167 T | Key | 1 | .035 |
| 13 | 32519 D | Spacer | 1 | .250 | 24 | 29764 D | Pin | 1 | .781 |
| 14 | 32513 D | Bushing | 1 | .031 | 25 | 32501 D | Shaft | 1 | ..... |
| 15 | 32505 D | Nut | 1 | .031 | ... | Q 1909 | Slotted hex. nut, 1/2" N.F. | 1 | ..... |
| 16 | 32497 DX | Gasket | 1 | 1.337 | ... | Q 1909 | Hex. nut, 1/2" N.F. | 1 | ..... |
| 17 | 32499 DAX | Gear with bushing (27 teeth) | 1 | 1.300 | 26 | 32502 D | Cotter, 3/32 x 1" | 1 | .125 |
| 18 | 32499 DAX | Shaft with dowel pin and pipe plug | 1 | ..... | 27 | ..... | Washer | 1 | .046 |
| 19 | 32499 DAX | Key | 1 | .004 | ... | ... | Nut, 1/2" N.F. | 1 | ..... |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

SPARK PLUG CABLES, ETC.



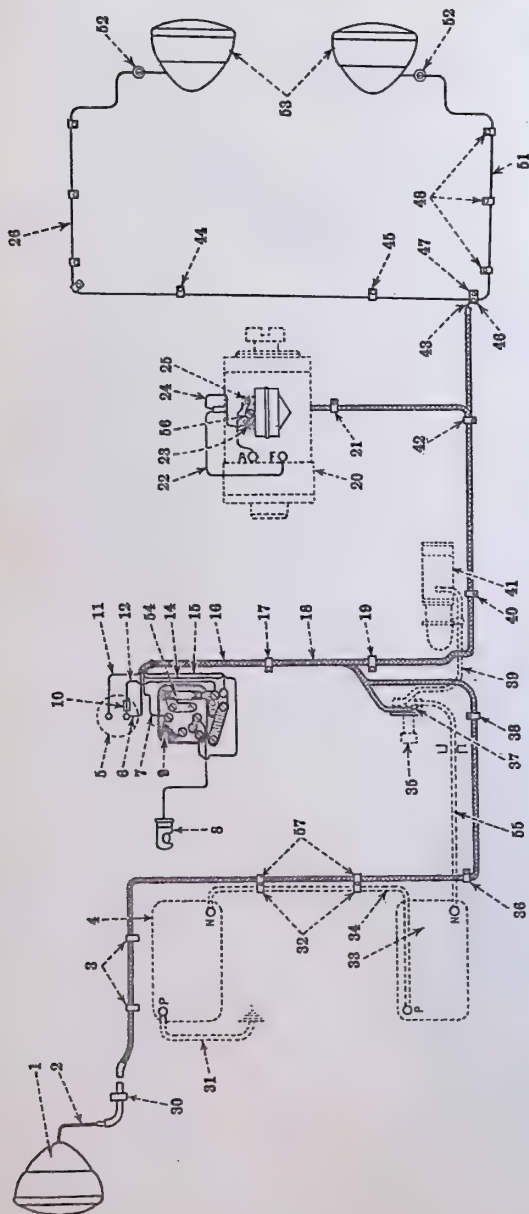
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 1 | 65347 D | Cable, No. 2. | 1 | .078 |
| 2 | 65346 D | Cable, No. 1. | 1 | .109 |
| 3 | 43006 D | Generator heat shield | 1 | 2.375 |
| ... | ... | Cap screw, 3/8 x 3/4" N.C. | 2 | .045 |
| ... | Q 1920 | Lock washer, 3/8" | 2 | .005 |
| 4 | 65340 D | Cable, No. 6. | 1 | .156 |
| 5 | 65351 D | Cable, No. 5. | 1 | .125 |
| 6 | 65336 D | Cable, No. 4. | 1 | .109 |
| 7 | 65335 D | Cable, No. 3. | 1 | .093 |
| 8 | 39749 DA | Clip. | 1 | .125 |
| ... | Q 4016 | Cap screw, 3/8 x 5/8" N.C. | 1 | .041 |
| ... | Q 4000 | Cap screw, 1/4 x 5/8" N.C. | 1 | .017 |
| ... | Q 1920 | Lock washer, 3/8" | 1 | .005 |
| ... | Q 1918 | Lock washer, 1/4" | 1 | .002 |
| ... | Q 1902 | Hex. nut, 1/4" N.C. | 1 | .007 |
| 9 | 27387 D | Clip, front | 1 | .015 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 1 | .045 |
| ... | Q 1920 | Lock washer, 3/8" | 1 | .005 |
| 10 | 46886 DX | Short circuiting cable. | 1 | .062 |
| 11 | 5992 D | Generator bracket | 1 | .625 |
| ... | Q 1832 | Cap screw, 7/16 x 1-1/4" N.C. | 2 | .084 |
| ... | Q 1921 | Lock washer, 7/16" | 2 | .01 |
| 12 | 50585 D | Generator (Delco-Remy No. 1101724). | 1 | 18.750 |
| ... | Q 1836 | Cap screw, 3/8 x 1-3/4" N.C. | 4 | .076 |
| ... | ... | Cap screw, 5/16 x 1-3/8" N.F. | 1 | .046 |
| ... | ... | Hex. nut, 5/16" N.F. | 1 | .015 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| ... | Q 1919 | Lock washer, 5/16" | 1 | .013 |
| 13 | 57550 D | Cut-out relay (Delco-Remy No. 1116810). | 1 | .656 |
| 14 | 56458 D | Cable clip, rear. | 1 | .125 |
| ... | Q 1753 | Cap screw, 1/4 x 1/2" N.F. | 1 | .016 |
| ... | Q 1901 | Hex. nut, 1/4" N.F. | 1 | .007 |
| ... | Q 1920 | Lock washer, 3/8" | 1 | .005 |
| ... | Q 1918 | Lock washer, 1/4" | 1 | .002 |
| ... | 27618 D | Cable reinforcement | 6 | .006 |
| ... | 37291 D | Terminal (push type). | 6 | .010 |
| ... | 65366 D | Cable assembly. (includes Ref. Nos. 1, 2, 4, 5, 6, 7 and 10). | 1 | .812 |
| ... | 1924 T | Terminal (ring type). | 6 | ..... |

NOTE: All service and replacement parts for the generator should be referred to an authorized United Motors Service Branch or Service Station.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

STARTING AND LIGHTING UNIT WIRING DIAGRAM



B-455

When ordering parts, refer to pages 10 to 13.

| Ref. No. | I H C Part No. | Description | Ref. No. | I H C Part No. | Description |
|----------|----------------|--|----------|----------------|--|
| 1 | 68972 D | Rear lamp. | 26 | 49186 DX | Left head lamp cable with loom, complete. |
| 2 | ..... | Cable (black with white tracer) switch to rear lamp. | 30 | 39019 D | Left head lamp cable loom. |
| 3 | 10789 V | Loom clip (3/16" for 3/8" bolt) on fender mounting bolt. | 31 | 27386 D | Rear lamp cable conduit clip (on fender mounting bolt in bracket). |
| 4 | 60913 DNS | Battery. | | | |
| 5 | 42383 D | Ammeter. | | | |
| | | | 31 | 42833 D | Cable (battery to ground). |

SPARE PARTS CATALOG

STARTING AND LIGHTING UNIT - Continued

| | | | | | |
|----|----------|--|----|----------|--|
| 6 | ..... | Cable (natural with black and red cross tracers) generator to ammeter (order 59184 D). | 32 | 36100 D | Cable clip (on seat support, front) battery to battery. |
| 7 | ..... | Cable (black) switch to junction block (order 59184 D). | 33 | 60913 D | Battery. |
| 8 | 65534 D | Dash lamp. | 34 | 41906 D | Cable (battery to battery). |
| 9 | 57311 DX | Light switch. | 35 | 64931 H | Starting switch. |
| 10 | 45027 H | Cable insulator (ammeter to switch). | 36 | 10439 VA | Loom clip (3/16" for 3/8" bolt) on seat support, front. |
| 11 | ..... | Cable (natural with red tracer) starting switch to ammeter (order 59184 D). | 37 | ..... | Cable (natural with red tracer) starting switch to ammeter (order 59184 D). |
| 12 | 30436 D | Cable, less loom (ammeter to switch). | 38 | 27248 H | Loom clip, long (1/4" for 3/8" bolt) on fender side sheet mounting screw. |
| 14 | ..... | Cable (black with white tracer) switch to rear lamp (order 59184 D). | 39 | 41909 D | Cable (starting switch to starting motor). |
| 15 | ..... | Cable (natural with black tracer) generator field to switch (order 59184 D). | 40 | 27385 D | Loom clip (1/4" for 3/8" bolt) on side angle. |
| 16 | 59184 D | Cable harness. Must be clipped so it lays close against dash and at least 2-1/2" away from exhaust manifold. | 41 | 42999 D | Starting motor. |
| 17 | 38411 D | Loom clip (3/8" for 3/8" bolt) on dash. | 42 | 27385 D | Loom clip (1/4" for 3/8" bolt) on side angle. |
| 18 | 59184 D | Cable harness. Must be clipped so that it does not cross opening in dash for foot brake pedal. Pedal must not touch harness at any time. | 43 | ..... | Cable (black) switch to head lamp (order 59184 D). |
| 19 | 61271 D | Loom clip (1/4" for 5/8" bolt) on flywheel housing bolt. | 44 | 27385 D | Loom clip (1/4" for 3/8" bolt) on fan shroud bolts. |
| 20 | 50585 D | Generator. | 45 | 27385 D | Loom clip (1/4" for 3/8" bolt) on fan shroud bolts. |
| 21 | 27386 D | Loom clip (1/4" for 1/2" bolt) on magneto bracket bolt. | 46 | 42917 D | Head lamp junction block with bracket, complete. |
| 22 | ..... | Cable (natural with black tracer) generator field to switch (order 59184 D). | 47 | 42915 D | Head lamp junction block. |
| 23 | ..... | "BAT" terminal. | 48 | 27385 D | Head lamp junction block bracket. |
| 24 | ..... | Cable (natural with black and red cross tracers) generator to ammeter (order 59184 D). | 51 | 30422 D | Loom clip (1/4" for 3/8" bolt) on fan shroud bolts. |
| 25 | ..... | "GEN" terminal. | 52 | 30693 DX | Right hand head lamp cable loom. |
| | | | 53 | 1627 V | Right hand head lamp cable with loom. |
| | | | 54 | 68972 D | Head lamp cable grommet. |
| | | | 55 | 10815 V | Head lamp. |
| | | | 56 | 41903 DA | Fuse. |
| | | | 57 | 42914 D | Battery to starting switch cable. Mounting screw. Rear lamp cable clip (on seat support, front). |

SPARE PARTS CATALOG

STARTING AND LIGHTING UNIT

| I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------------|---|-------------|-------------|
| 60938 D | Loom clip (1/4" for 3/8" bolt) | 14 | .015 |
| 62302 D | Rear lamp cable conduit clip (1/4" for 1/2" bolt) | 1 | .031 |
| 62302 D | Loom clip (1/4" for 1/2" bolt) | 1 | .031 |
| 38100 D | Battery to battery cable clip | 2 | .031 |
| Q 1800 | Cap screw, 3/8 x 3/4" N.F. | 2 | .045 |
| Q 1905 | Hex. nut, 3/8" | 2 | .031 |
| Q 1920 | Lock washer, 3/8" | 2 | .005 |
| 38411 D | Loom clip (3/8" for 3/8" bolt) | 1 | ..... |
| 41916 D | Cable clip - starting switch to starting motor | 1 | .062 |
| 42383 D | Ammeter | 1 | .250 |
| 42914 D | Rear lamp cable clip | 2 | .083 |
| 42915 D | Head lamp junction block | 1 | .010 |
| ..... | Round head machine screw, No. 10 - 24 x 1/2" | 1 | ..... |
| ..... | Hex. nut, No. 10 - 24 | 1 | ..... |
| ..... | Lock washer, No. 10 | 1 | ..... |
| 42916 D | Head lamp junction block bracket | 1 | .031 |
| 42917 D | Head lamp junction block and bracket assembly | 1 | .062 |
| 42921 D | Head lamp bracket | 2 | .750 |
| Q 1848 | Cap screw, 1/2 x 1" N.C. | 4 | .106 |
| Q 1922 | Lock washer, 1/2" | 4 | .013 |
| 42921 D | Rear lamp bracket | 1 | ..... |
| Q 1847 | Cap screw, 1/2 x 1" N.F. | 2 | .106 |
| Q 1909 | Hex. nut, 1/2" N.F. | 2 | .069 |
| Q 1922 | Lock washer, 1/2" | 2 | .013 |
| *42999 D | Starting motor (Delco-Remy Model No. 756) | 1 | 45.000 |
| Q 1849 | Cap screw, 1/2 x 1-1/4" N.F. | 3 | .120 |
| Q 1922 | Lock washer, 1/2" | 3 | .013 |
| 68972 D | Head lamp or rear lamp (see detail list, page 12) | 3 | 7.000 |
| *50585 D | Generator (Delco-Remy No. 1101724) | 1 | 25.000 |
| Q 1808 | Cap screw, 3/8 x 1-3/4" | 4 | .076 |
| ..... | Cap screw, 5/16 x 1-3/8" N.F. | 1 | .046 |
| Q 1903 | Hex. nut, 5/16" N.F. | 1 | .015 |
| Q 1920 | Lock washer, 3/8" | 4 | .005 |
| Q 1919 | Lock washer, 5/16" | 1 | .003 |
| ** 55468 D | Battery - Willard No. 5245 Type DRG-17-3 (optional) | 2 | 88.000 |
| 60913 DNS | Battery - Auto-Lite H-17 (optional) | 2 | 70.000 |
| *57550 D | Cut-out relay (Delco-Remy No. 1116810) | 1 | .750 |
| 57311 DX | Lighting switch (see detail list, page 11) | 1 | .625 |
| 59989 D | Battery cable shield | 1 | .812 |
| ..... | Cap screw, 3/8 x 5/8" N.F. | 3 | .045 |
| Q 1905 | Hex. nut, 3/8" N.F. | 3 | .031 |
| Q 1920 | Lock washer, 3/8" | 3 | .005 |
| 61271 D | Loom clip (1/4" for 5/8" bolt) | 1 | ..... |
| 63323 D | Battery cable grommet (in dash) | 1 | .012 |
| 65534 D | Dash lamp | 1 | .125 |
| 27248 H | Loom clip (1/4" for 3/8" bolt) | 1 | .062 |
| 64931 H | Starting switch | 1 | .437 |
| Q 1761 | Cap screw, 1/4 x 1-1/2" N.F. | 2 | .029 |
| Q 1901 | Hex. nut, 1/4" N.F. | 2 | .007 |
| Q 1918 | Lock washer, 1/4" | 2 | .002 |

(Continued on next page)

* All service and replacement parts should be referred to an authorized United Motors Service Station or Branch.

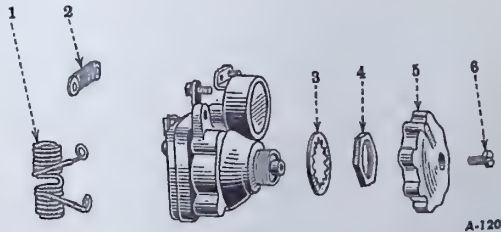
** All service and replacement parts should be referred to the battery manufacturer.

SPARE PARTS CATALOG

STARTING AND LIGHTING UNIT - Continued

| I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------------|---|-------------|-------------|
| 10439 VA | Loom clip (3/16" for 3/8" bolt) | 1 | .062 |
| 10815 V | Fuse | 1 | .005 |
| 1627 Y | Hood grommet | 2 | .007 |
| CABLES | | | |
| 30436 D | Ammeter to switch cable, includes 2 terminals 38433 D | 1 | 1.000 |
| 30693 DX | Right head lamp cable, includes 2 terminals 38433 D, loom 30422 D, and 2 clamp rings 27618 D | 1 | .152 |
| 41906 D | Battery to battery cable, includes positive terminal 26375 H, with bolt and nut 26453 HX and negative terminal 26376 H, with bolt and nut 26453 HX. | 1 | 2.125 |
| 41908 DA | Battery to starting switch cable, includes terminal 46074 H and negative terminal 26376 H with bolt and nut 26453 HX. | 1 | 2.750 |
| 41909 D | Starting switch to starting motor cable, includes terminal 46074 H and terminal 23431 D. | 1 | .750 |
| 42833 D | Battery to ground cable, includes positive terminal 38778 D, with bolt and nut 26453 HX | 1 | 1.000 |
| 49186 DX | Left head lamp cable, includes 2 terminals 38433 D, loom 39019 D and 2 clamp rings 27618 D | 1 | .250 |
| 59184 D | Cable harness, includes terminal 38937 D, terminal 27637 H and 8 terminals 38433 D | 1 | 1.375 |

DETAIL PARTS OF LIGHT SWITCH (57311 DX)

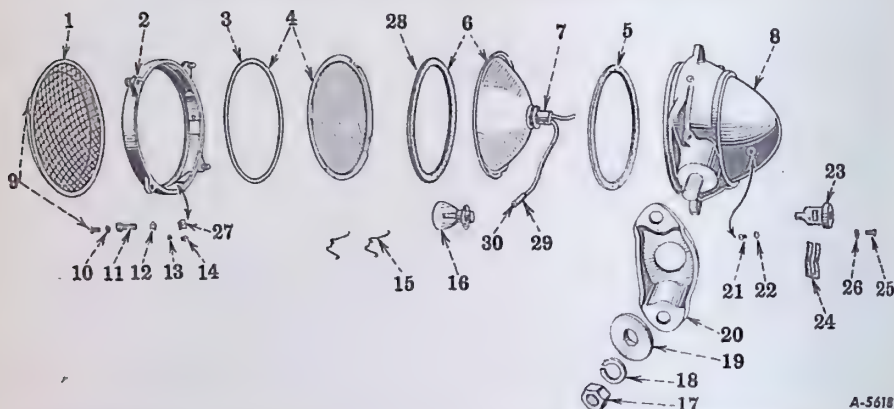


| Ref. No. | I H C Part No. | Delco-Remy Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|------------------------|---|-------------|-------------|
| ... | 57311 DX | ..... | Light switch | 1 | .625 |
| ... | ..... | ..... | Lock washer, No. 8 | 1 | .... |
| 1 | 43039 D | 1877830 | Dimmer resistance coil | 1 | .015 |
| 2 | 43040 D | 1877831 | Generator field resistance coil. | 1 | .008 |
| 3 | 49425 H | ..... | Lock washer (Shakeproof No. 1230) | 1 | .015 |
| 4 | 57312 D | 1882012 | Switch mounting nut. | 1 | .015 |
| 5 | 57313 D | 1882013 | Switch knob. | 1 | .083 |
| 6 | 64022 H | 1864099 | Switch mounting screw. | 1 | .002 |
| ... | ..... | ..... | Lock washer, No. 8 | 1 | .... |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

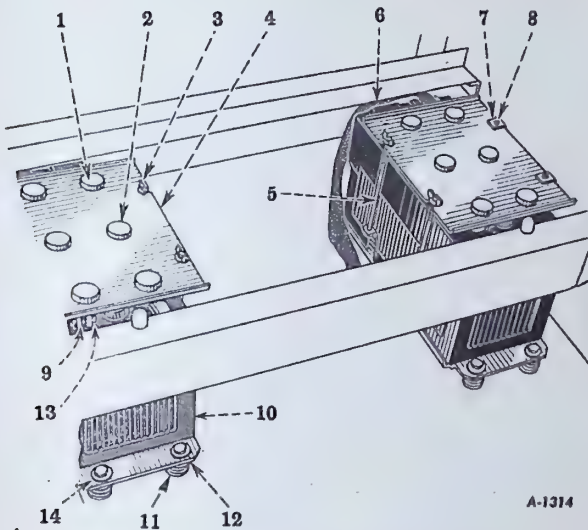
DETAIL PARTS OF HEAD LAMP (68972 D)



A-5618

| Ref. No. | I H C Part No. | Guide Lamp Co. No. | Description | No. used per lamp | Wt. Lbs. |
|----------|----------------|--------------------|---|-------------------|----------|
| ... | 69369 D | 5935617 | Door and guard assembly with lens | 1 | |
| ... | 68417 D | 5935509 | Terminal plate assembly. | 1 | |
| 1 | 69373 D | 5935616 | Guard assembly | 1 | |
| 2 | 69370 D | 5935615 | Door only. | 1 | |
| 3 | 69372 D | 5935246 | Gasket | 1 | |
| 4 | 50784 D | 921634 | Lens with gasket | 1 | .750 |
| 5 | 68418 D | 5935245 | Door gasket. | 1 | |
| 6 | 65401 D | 5931286 | Reflector with gasket. | 1 | |
| 7 | 51893 D | 924023 | Socket assembly with wire. | 1 | .062 |
| 8 | 69368 D | 5935618 | Body assembly. | 1 | |
| 9 | 69374 D | 5935504 | Screw No. 6 - 32 x 3/8". | 4 | |
| 10 | 41229 H | ..... | Lock washer, No. 6 (Shakeproof No. 1206) | 4 | .000 |
| 11 | 69376 D | 5935634 | Cap screw, 1/4" N.C. x 7/8". | 4 | |
| 12 | ..... | ..... | Lock washer, 1/4". | 4 | |
| 13 | Q 1915 | 106495 | Lock washer, No. 6 | 1 | |
| 14 | ..... | 132684 | Screw, No. 6 - 32 x 3/16". | 1 | |
| 15 | 50539 H | 914255 | Spring | 2 | .000 |
| 16 | 66340 H | ..... | Bulb - 12 volt (Mazda No. 2326). | 1 | .031 |
| 17 | ..... | 103030 | Hex. jam nut, 5/8" N.F. | 1 | .127 |
| 18 | Q 1925 | ..... | Lock washer, 5/8". | 1 | .013 |
| 19 | 36273 D | 234869 | Washer | 1 | .012 |
| 20 | 42921 D | ..... | Bracket. | 1 | .750 |
| 21 | 37536 H | 121749 | Screw, No. 8 - 32 x 5/16". | 1 | |
| 22 | ..... | ..... | Lock washer, 1/2". | 1 | |
| 23 | ..... | 922786 | Head lamp terminal plate (Order 68417 D). | 1 | |
| 24 | ..... | 922785 | Terminal spring (Order 68417 D). | 1 | |
| 25 | 37536 H | 121749 | Round head machine screw No. 8 - 32 N.C. - 2 x 5/16". | 2 | |
| 26 | 48716 H | 138530 | Lock washer No. 8 (Shakeproof No. 1208) | 1 | .003 |
| 27 | 69371 D | 921633 | Clip | 1 | |
| 28 | 79398 H | 921789 | Reflector gasket | 1 | |
| 29 | 68084 D | 804463 | Insulating sleeve. | 1 | |
| 30 | 27640 H | 1867662 | Terminal wire. | 1 | |
| ... | 69805 D | 5933831 | Ground screw. | 1 | |
| ... | 47834 H | 120622 | Ground screw nut | 1 | |
| ... | 104562 H | 121752 | Ground screw lock washer | 1 | |

BATTERIES AND CONNECTIONS



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|---|-------------|-------------|
| 1 | 50234 D | Battery hold-down rubber, short. | 4 | .046 |
| 2 | 50235 D | Battery hold-down rubber, long | 8 | .062 |
| 3 | Q 3505 | Wing nut, 5/16" N.C. | 4 | .014 |
| 4 | 41832 DBX | Cover. | 2 | 4.500 |
| 5 | 52435 D | Bolt | 4 | .250 |
| 6 | 42833 D | Ground cable | 1 | 1.000 |
| 7 | 41831 D | Washer | 4 | .031 |
| 8 | 41830 D | Stud | 4 | .312 |
| ... | Q 1904 | Hex. nut, 5/16" N.C. | 16 | .015 |
| 9 | 41908 DA | Starting switch cable. | 1 | 2.750 |
| ... | 60913 DNS | Battery (Auto-Lite No. H-17) (optional). . . | 2 | 87.000 |
| 10 | 55468 D | Battery (Willard No. 5245 Type DRG-17-3) (optional). | 2 | 88.000 |
| 11 | 37976 D | Battery bottom rest spring | 8 | .125 |
| ... | 41827 D | Battery bottom mounting spacer | 8 | .125 |
| 12 | 41826 DXA | Battery bottom support | 2 | 6.250 |
| ... | Q 1858 | Cap screw, 1/2 x 2-1/4" N.C. | 8 | .175 |
| ... | ..... | Washer, 17/32" I.D. x 1-1/4" O.D. x 14 ga. | 8 | ..... |
| 13 | 26453 HX | Battery terminal bolt with nut | 4 | .050 |
| 14 | ..... | Washer, 17/32" I.D. x 1-1/4" O.D. x 14 ga. . | 8 | ..... |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

ENGINE

| | |
|--|----------|
| Air Cleaner and Connections. | 1 |
| Camshaft | 6, 8 |
| Crankcase. | 2 to 4 |
| Crankcase Guard. | 5 |
| Crankcase Oil Pan. | 14, 15 |
| Crankshaft | 10 to 13 |
| Cylinder Head. | 6 to 8 |
| Cylinder Sleeves | 10, 11 |
| Exhaust Muffler. | 18 |
| Flywheel | 10, 11 |
| Front Pull Hook. | 5 |
| Fuel Oil Filter. | 9 |
| Lubricating Oil Filter | 9 |
| Lubricating Oil Pump | 14, 15 |
| Manifolds, Intake and Exhaust. | 16, 17 |
| Pistons. | 10, 11 |
| Spark Plugs. | 6, 8 |
| Starting Crank | 2, 4 |
| Valves | 6 to 8 |

COMPLETE ENGINE REPLACEMENT

68263 D ENGINE COMPLETE; also includes ACCESSORIES shown in COLUMN 1.

68264 D ENGINE COMPLETE; also includes ACCESSORIES shown in COLUMN 2.

68265 D ENGINE COMPLETE; also includes ACCESSORIES shown in COLUMN 3.

NOTE: The following standard parts are used to attach the above COMPLETE ENGINES.

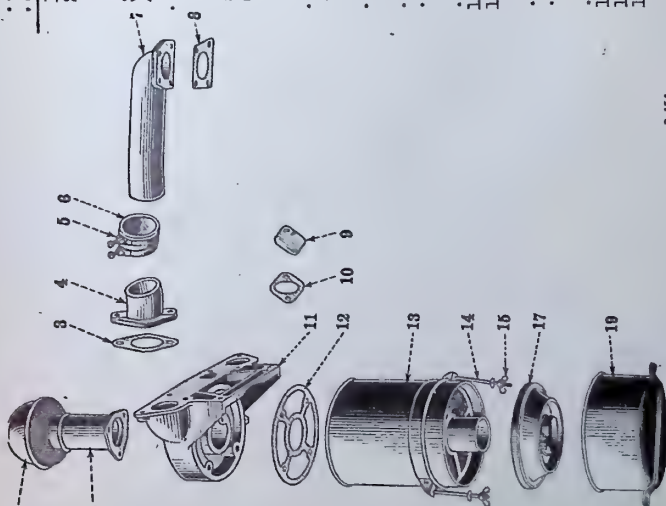
| | | |
|--------|---|----|
| ..... | Cap screw, 5/8" N.C. x 1-5/8" | 6 |
| Q 1878 | Cap screw, 5/8" N.C. x 2-1/2" | 2 |
| Q 1925 | Lock washer, 5/8" | 10 |
| Q 4109 | Cap screw, 5/8" N.F. x 3-3/4" | 2 |
| Q 1911 | Hex. nut, 5/8" N.F. | 2 |

| ACCESSORIES | 1 | 2 | 3 |
|--|---|---|---|
| Cylinder head, complete, and injection nozzles | x | x | x |
| Oil pan and oil pump | x | x | x |
| Diesel starting mechanism. | x | x | x |
| Oil level gage | x | x | x |
| Manifolds. | x | x | x |
| Fan drive pulley and vibration damper. | x | x | x |
| Flywheel with ring gear and clutch pilot bearing. | x | x | x |
| Water outlet and thermostat housing. | x | x | x |
| Front engine support with mounting bolts | x | x | x |
| Rear engine support with mounting bolts. | x | x | x |
| Front engine support shims | x | x | - |
| Rear engine support dowel bolts and nuts | x | x | - |
| Hourmeter. | x | x | - |
| Thermostats. | x | x | - |
| Spark plugs. | x | x | - |
| Carburetor and starting primer | x | x | - |
| Magneto, magneto coupling and wiring | x | x | - |
| Diesel fuel injection pump with pipes and filter system. | x | x | - |
| Lubrication oil filter | x | x | - |
| Water pump with fan and belts. | x | x | - |
| Starting motor | x | x | - |
| Generator and supports | x | x | - |
| Engine clutch. | x | - | - |

SPARE PARTS CATALOG

AIR CLEANER AND CONNECTIONS

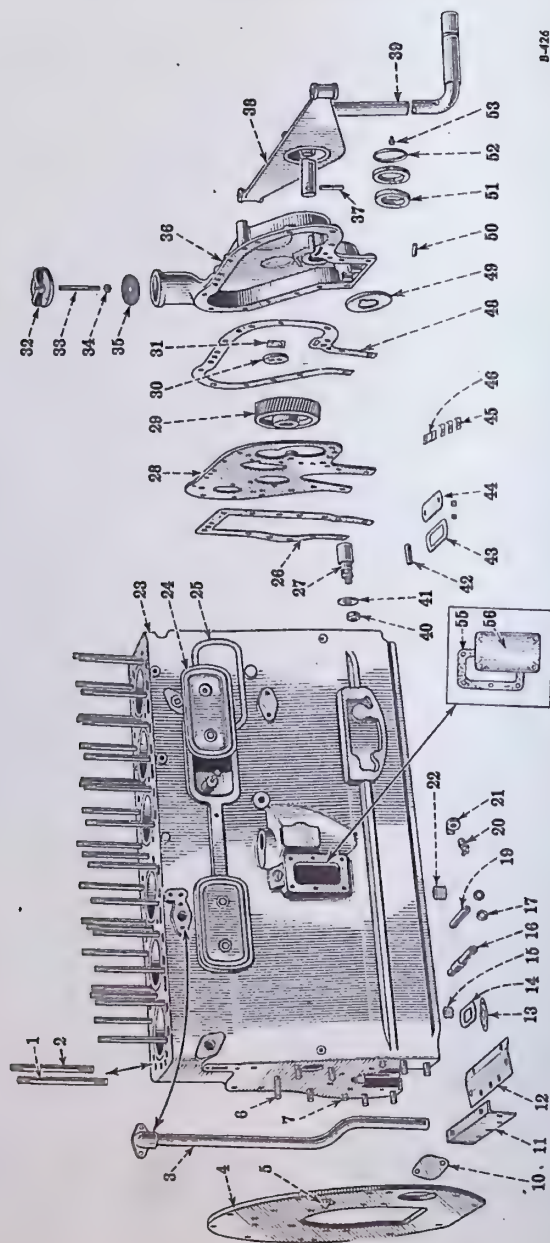
| Ref. No. | I H C Part No. | Donaldson Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--------------------|--|----------|----------|
| ... | 58200 D | ..... | Air cleaner (includes Ref. Nos. 13 thru 19). | 1 | 31.500 |
| ... | ..... | ..... | Cap screw, 1/2 x 5" N.C. | 4 | .328 |
| ... | ..... | ..... | Lock washer, 1/2". | 4 | .013 |
| 1 | 49364 DA | ..... | Air intake cap. | 1 | 2.500 |
| 2 | 59213 D | ..... | Air pipe assembly | 1 | 1.750 |
| ... | Q 4017 | ..... | Cap screw, 3/8 x 7/8" N.C. | 3 | .048 |
| ... | Q 1920 | ..... | Lock washer, 3/8" | 3 | .005 |
| 3 | 59210 D | ..... | Air pipe gasket | 1 | .875 |
| 4 | 8830 D | ..... | Pipe, rear. | 1 | |
| ... | ..... | ..... | Cap screw, 1/2 x 1-3/8" | 1 | |
| ... | ..... | ..... | N.C. | 1 | .134 |
| ... | Q 1922 | ..... | Lock washer, 1/2" | 1 | .013 |
| 5 | 58218 D | ..... | Hose clamp (Wittek GM-85) | 2 | .125 |
| 6 | 58209 D | ..... | Hose (2-3/4" long x 3-1/4" I.D.) | 1 | .002 |
| 7 | 8829 D | ..... | Air cleaner pipe, front. | 1 | 11.000 |
| ... | Q 1802 | ..... | Cap screw, 3/8 x 1" N.C. | 4 | .052 |
| 8 | 41638 D | ..... | Air pipe gasket | 1 | .035 |
| 9 | 59214 D | ..... | Top cover | 1 | 1.500 |
| ... | Q 1850 | ..... | Cap screw, 1/2 x 1-1/4" | 1 | |
| ... | ..... | ..... | N.C. | 1 | .120 |
| ... | Q 1922 | ..... | Lock washer, 1/2" | 2 | .013 |
| ... | Q 1852 | ..... | Cap screw, 1/2 x 1-1/2" | 1 | |
| ... | Q 1922 | ..... | N.F. | 1 | .133 |
| 10 | 58210 D | ..... | Hex. nut, 1/2" N.F. | 1 | .069 |
| 11 | 8832 D | ..... | Gasket. | 1 | .875 |
| ... | Q 1848 | ..... | Control housing and air cleaner top. | 1 | 38.500 |
| ... | ..... | ..... | Cap screw, 1/2 x 1" N.C. | 2 | .106 |
| ... | ..... | ..... | Cap screw, 1/2 x 1-3/8" | 1 | |
| ... | ..... | ..... | N.C. | 3 | .134 |
| ... | ..... | ..... | Lockwasher, 1/2" | 5 | .013 |
| ... | Q 1922 | ..... | Gasket. | 1 | .235 |
| 12 | 58185 D | ..... | Body assembly | 1 | 22.500 |
| 13 | 59416 D | 2P-3752 | Square head bolt, 5/16 x 5-1/2" N.C. | 2 | .140 |
| 14 | ..... | ..... | Wing nut, 5/16" N.C. | 2 | .034 |
| 15 | ..... | ..... | Screen and baffle assembly. | 1 | 2.000 |
| 17 | 67119 D | 2P-4891 | Fillister head screw, 1/4 x 1" N.C. | 1 | .014 |
| ... | ..... | ..... | Square nut, 1/4" N.C. | 1 | .007 |
| 19 | 45904 DB | P-3296 | Oil cup assembly. | 1 | 4.500 |



Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

CRANKCASE



B-426

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

CRANKCASE - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|------------------------------|----------|----------|----------|----------------|--|----------|----------|
| 1 | 39810 D | Cylinder head stud, long. | 23 | .687 | 23 | 654E DEX | Crankcase with plugs, studs and camshaft bearings and cap. | 1 | |
| 2 | 42717 D | Cylinder head stud, short | 8 | .500 | ... | ..... | Square head pipe plug, 1/4" | 1 | |
| 3 | 55307 DX | Breather pipe. | 1 | 2.750 | 24 | 39756 D | Side plate. | 2 | .875 |
| ... | Q 1804 | Cap screw, 3/8 x 1-1/4" N.C. | 2 | .060 | ... | Q 4017 | Cap screw, 3/8 x 7/8" N.C. | 4 | .048 |
| 4 | Q 1920 | Lock washer, 3/8" | 2 | .005 | 25 | 39757 D | Gasket. | 2 | .002 |
| 4 | 42707 DAX | Rear engine support. | 1 | 49.000 | 26 | 32368 DA | Front plate gasket. | 1 | .062 |
| 5 | 42708 D | Timing indicator. | 1 | .062 | 27 | 25138 DAX | Idler gear shaft with pin. | 1 | 1.125 |
| ... | ..... | Flat head rivet, 3/16 x 3/4" | 2 | | 28 | 38814 DX | Idler gear shaft with pin (.015" O.S.). | 1 | 1.125 |
| 6 | 42718 DB | Rear engine support stud. | 11 | .125 | 29 | 32367 DAX | Front plate. | 1 | 13.750 |
| ... | Q 1911 | Hex. nut, 5/8" N.F. | 11 | .127 | ... | Q 1848 | Cap screw, 1/2 x 1" N.C. | 5 | .106 |
| 7 | 25086 DA | Dowel pin. | 2 | .062 | 30 | 25131 D | Idler gear with bushing (64 teeth). | 1 | 7.625 |
| 10 | 25063 DA | Timing mark cover. | 1 | .062 | ... | Q 1773 | Thrust washer. | 1 | .328 |
| ... | Q 4014 | Cap screw, 5/16 x 5/8" N.F. | 2 | .030 | 31 | 25130 D | Cap screw, 5/16 x 3/4" N.F. | 2 | .030 |
| ... | Q 1919 | Lock washer, 5/16" | 2 | 1.125 | 32 | 3713 DA | Cap screw lock. | 1 | .062 |
| 11 | 42713 D | Dust seal. | 1 | .045 | 33 | 28940 D | Oil filler cap. | 1 | .750 |
| ... | Q 1799 | Cap screw, 3/8 x 3/4" N.F. | 5 | .060 | 34 | Q 1906 | Stud. | 1 | .062 |
| ... | Q 1804 | Cap screw, 3/8 x 1-1/4" N.C. | 2 | .005 | 35 | 1242 DB | Hex. nut, 3/8" N.C. | 1 | .031 |
| ... | Q 1920 | Lock washer, 3/8" | 2 | .062 | 36 | 5976 DX | Strainer. | 1 | .046 |
| 12 | 42714 D | Dust seal gasket. | 1 | .002 | ... | ... | Front cover includes ref. nos. 31, 51, 52 and oil flinger troughs. | 1 | 40.000 |
| 13 | 25121 D | Gasket. | 1 | .004 | ... | Q 1854 | Cap screw, 1/2 x 1-3/4" N.C. | 9 | .148 |
| 14 | 39764 D | plug, 3/4" | 1 | .437 | ... | Q 1922 | Lock washer, 1/2" | 9 | .013 |
| 15 | ..... | Oil level gage sleeve. | 1 | .007 | 37 | 30624 D | Starting crank ratchet pin. | 1 | .125 |
| 16 | 42862 D | Washer. | 4 | .125 | 38 | 42709 DX | Front engine support. | 1 | 23.000 |
| 17 | 62866 D | Oil filter return pipe. | 1 | .077 | ... | ..... | Pipe nipple, 1/8x2" | 1 | |
| 19 | 42851 D | Drain cock elbow, 3/8" | 1 |  | ... | ..... | Pipe coupling, 1/8" | 1 | |
| 20 | 21729 D | plug, 1" | 1 |  | ... | ..... |  | 1 | |
| 21 | ..... |  | 1 |  | ... | ..... |  | 1 | |
| 22 | ..... |  | 1 |  | ... | ..... |  | 1 | |

(Continued on next page.)

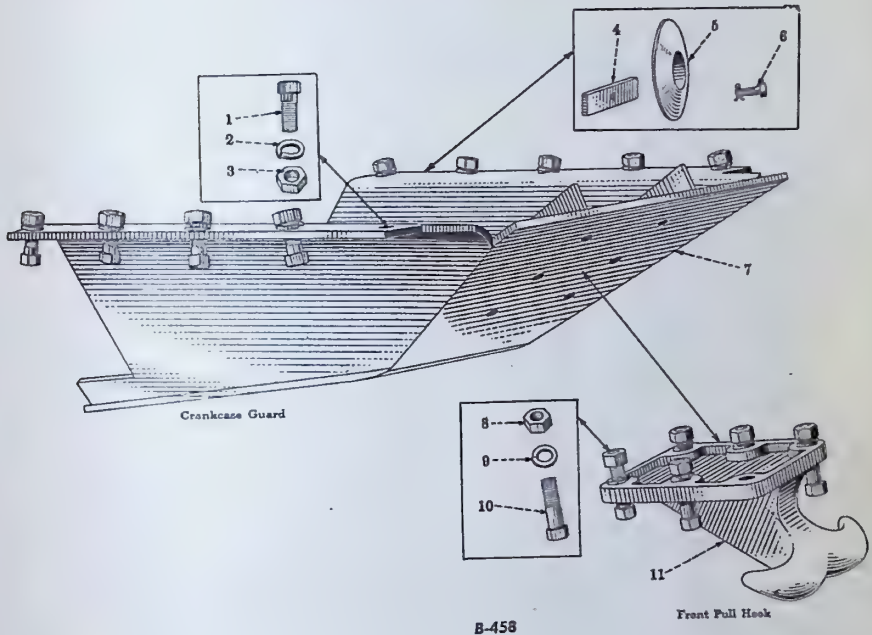
SPARE PARTS CATALOG

CRANKCASE - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|------------------------------------|----------|----------|----------|----------------|---|----------|----------|
| 39 | 40875 DAXA | Starting crank | 1 | .201 | ... | 50410 DA | Oil header plug, 1/8" | 4 | .250 |
| 40 | ..... | Nut, 3/4" N.F. | 1 | .062 | ... | 50474 DA | Oil header plug, 1/4" | 5 | .064 |
| 41 | 25132 D | Nut lock. | 1 | .125 | ... | 53643 D | Cross shaft latch bracket stud. | 1 | |
| 42 | 25087 D | Dowel. | 2 | .005 | ... | Q 1905 | Hex. nut, 3/8" | 1 | |
| 43 | 39752 D | Gasket. | 1 | .312 | ... | Q 1920 | N.F. | 1 | .031 |
| 44 | 39761 D | Plate. | 1 | .045 | ... | 62863 D | Lock washer, 3/8" | 1 | .005 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 2 | .031 | ... | Q 1911 | Rear engine support dowel bolt, 2-1/8" | 2 | .125 |
| 45 | Q 1920 | Lock washer, 3/8" | 2 | .062 | ... | Q 1925 | Hex. nut, 5/8" | 2 | .127 |
| 46 | 32370 D | Screw lock. | 3 | .032 | ... | 13897 D | N.F. | 2 | .013 |
| 47 | 39380 D | Screw strip. | 1 | .052 | ... | Q 4012 | Lock washer, 5/8" | 1 | .033 |
| 48 | 32371 D | Front cover gasket. | 1 | .032 | ... | 29565 D | Distributor hole lock washer | 1 | |
| 49 | 36796 DA | Oil flinger. | 1 | .250 | ... | 38028 DM | Cap screw, 5/16 x 5/8" N.C. | 1 | |
| 50 | 25954 D | Oil pan stud | 1 | .032 | ... | 39763 D | Distributor hole plug, 1-7/8" | 1 | |
| 51 | 36798 D | Felt. | 2 | .032 | ... | ... | Magneto drive metering plug. | 1 | |
| 52 | 36799 D | Retainer. | 1 | .250 | ... | ... | Push rod chamber rear plate. | 1 | |
| 53 | Q 3615 | Lubricator (Lincoln No. 5000) | 1 | .015 | ... | Q 4017 | Cap screw, 3/8 x 7/8" N.C. | 2 | .048 |
| 55 | 42733 D | Side cover gasket. | 1 | .012 | ... | Q 1920 | Lock washer, 3/8" | 2 | .005 |
| 56 | 8929 D | Side cover. | 1 | 1.375 | ... | 21826 H | Crankcase camshaft bearing plug, 2-1/4" | 1 | .030 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 4 | .052 | ... | 47415 H | Rear engine support stud nut lock washer. | 11 | |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 | ... | | | | |
| ... | 13062 D | Water jacket plug, 1-1/2" | 3 | .062 | ... | | | | |
| ... | 30397 D | Oil header plug, 1/2" | 4 | .046 | ... | | | | |
| ... | 36797 D | Oil flinger trough. | 1 | .250 | ... | | | | |
| ... | 45976 D | Front engine support shim (.0239") | 2 | .020 | ... | | | | |
| ... | 45977 D | Front engine support shim (.0149") | as req'd | .006 | ... | | | | |

SPARE PARTS CATALOG

CRANKCASE GUARD AND FRONT PULL HOOK



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

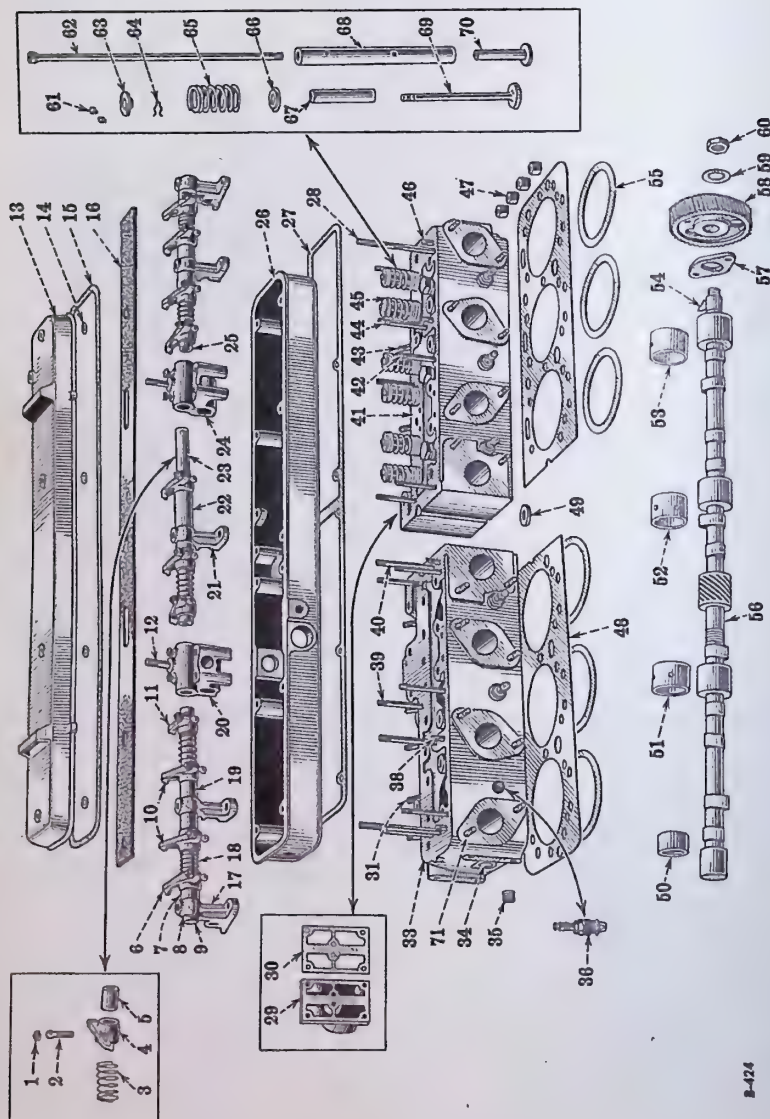
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---------------------------------|----------|----------|
| 1 | ..... | Bolt, 7/8 x 2" N.F. | 10 | |
| 2 | Q 1929 | Lock washer, 7/8" | 10 | .050 |
| 3 | ..... | Nut, 7/8" N.F. | 10 | .313 |
| 4 | 42877 D | Support | 1 | 1.125 |
| 5 | 5977 D | Cover | 1 | 2.000 |
| 6 | 42879 D | Bolt. | 1 | .125 |
| ... | ..... | Cotter, 1/8 x 3/4" | 1 | .003 |
| 7 | 42880 DA | Crankcase guard | 1 | 180.000 |
| 8 | ..... | Nut, 7/8" N.F. | 6 | .313 |
| 9 | Q 1920 | Lock washer, 7/8" | 6 | .050 |
| 10 | ..... | Bolt, 7/8 x 2-3/4" N.F. | 6 | |
| 11 | 5980 D | Pull hook | 1 | 41.500 |

When ordering, always use I H C Part Nos.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

CYLINDER HEAD, VALVES, ETC.



Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

CYLINDER HEAD, VALVE, ETC. - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|----------|----------------|---|----------|----------|
| 1 | 38763 H | Nut. | 12 | .006 | 22 | 32455 D | Spacer, center . . . | 1 | .375 |
| 2 | 10951 D | Adjusting screw. . . | 12 | .046 | 23 | 32454 DA | Shaft, center. . . . | 1 | 1.625 |
| 3 | 24961 D | Valve lever spring. . | 6 | .031 | 24 | 5029 DX | Front center bracket with stud . . . | 1 | 3.000 |
| 4 | 32468 DX | Valve lever, with bushing, right hand. | 3 | .500 | ... | Q 1818 | Cap screw, 3/8 x 3" N.C. | 4 | .115 |
| 5 | 24965 DB | Bushing. | 12 | .062 | ... | ... | Cup point headless set screw, 5/16 x 3/4" N.C. | 2 | |
| 6 | 32467 DX | Valve lever, with bushing, left hand. | 3 | .500 | ... | ... | Hex. jam nut, 5/16" N.C. . . . | 2 | .013 |
| 7 | 24962 D | Spacer, outer. | 3 | .093 | ... | Q 1920 | Lock washer, 3/8". | 4 | .005 |
| 8 | 27141 D | Retainer ring. | 2 | .012 | 25 | 27140 DDX | Shaft with retaining ring and plugs, (front and rear). | 2 | 1.562 |
| 9 | 13083 D | Shaft plug. | 6 | .500 | 26 | 5970 DX | Housing. | 1 | 25.000 |
| 10 | 32466 DX | Valve lever, with bushing, straight | 3 | .500 | ... | ... | Cap screw, 5/8 x 3/4" N.C. | 1 | .172 |
| 11 | 32468 DX | Valve lever, with bushing, right hand. | 2 | .125 | 27 | 32457 D | Housing gasket. . . . | 1 | .062 |
| 12 | 32463 D | Front center bracket stud. | 2 | .069 | 28 | 32447 DA | End bracket stud. . . | 2 | .250 |
| 13 | Q 1909 | Hex. nut, 1/2" N.F. | 1 | 20.000 | ... | Q 1909 | Hex. nut, 1/2" N.F. | 4 | .069 |
| 14 | 5020 DB | Cover. | 4 | .007 | 29 | 5973 D | Water manifold. . . . | 1 | 3.500 |
| 15 | 32458 D | Washer. | 1 | .062 | ... | Q 1804 | Cap screw, 3/8 x 1-1/4" N.C. . . . | 4 | .060 |
| 16 | 32462 D | Gasket. | 1 | .500 | ... | Q 1818 | Cap screw, 3/8 x 3" N.C. | 2 | .115 |
| 17 | 5027 DB | Felt. | 2 | .031 | ... | Q 1920 | Lock washer, 3/8". | 6 | .005 |
| 18 | Q 1905 | Hex. nut, 3/8" N.F. | 2 | .005 | 30 | 42762 D | Gasket. | 1 | .062 |
| 19 | Q 1920 | Lock washer, 3/8". | 6 | .031 | 31 | 54158 D | Nozzle body stud . . . | 5 | .250 |
| 20 | 24961 D | Valve lever spring. . | 4 | .156 | ... | 5968 DAXA | Cylinder head, rear (less valves). | 1 | 135.000 |
| 21 | 24964 D | Spacer, intermediate with stud. | 1 | 3.375 | ... | 5968 DAXA | (includes studs and valve guides) Cylinder head, rear (with valves). | 1 | 140.000 |
| 22 | Q 1818 | Cup screw, 3/8 x 3" N.C. | 4 | .115 | 33 | ... | (includes studs, valve guides, keys, seats, retainers and springs). | 2 | |
| 23 | ... | Cup point headless set screw 5/16 x 3/4" N.C. | 2 | .013 | ... | ... | Ctsk. pipe plug, 1/2". | 2 | |
| 24 | ... | Hex. jam nut, 5/16" N.C. | 4 | .005 | ... | ... | ... | ... | |
| 25 | Q 1920 | Lock washer, 3/8". | 3 | .750 | ... | ... | ... | ... | |
| 26 | 5028 D | Bracket, intermediate | 3 | .081 | ... | ... | ... | ... | |
| 27 | Q 1905 | Hex. nut, 3/8" N.F. | 3 | | ... | ... | ... | ... | |
| 28 | Q 1920 | Lock washer, 3/8". | 3 | | ... | ... | ... | ... | |
| 29 | 24961 D | Valve lever spring. . | 3 | | ... | ... | ... | ... | |
| 30 | 24964 D | Spacer, intermediate with stud. | 3 | | ... | ... | ... | ... | |
| 31 | 5972 DX | Cross shaft bracket | 3 | | ... | ... | ... | ... | |
| 32 | Q 1818 | Cap screw, 3/8 x 3" N.C. | 4 | | ... | ... | ... | ... | |
| 33 | ... | Cup point headless set screw 5/16 x 3/4" N.C. | 2 | | ... | ... | ... | ... | |
| 34 | ... | Hex. jam nut, 5/16" N.C. | 4 | | ... | ... | ... | ... | |
| 35 | Q 1920 | Lock washer, 3/8". | 3 | | ... | ... | ... | ... | |
| 36 | 5028 D | Bracket, intermediate | 3 | | ... | ... | ... | ... | |
| 37 | Q 1905 | Hex. nut, 3/8" N.F. | 3 | | ... | ... | ... | ... | |
| 38 | Q 1920 | Lock washer, 3/8". | 3 | | ... | ... | ... | ... | |

SPARE PARTS CATALOG

CYLINDER HEAD, VALVE, ETC. - Continued

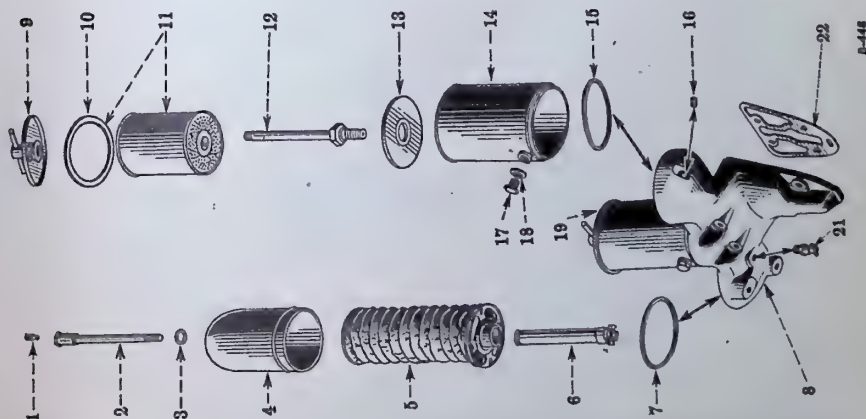
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|-------------------------------------|----------|----------|----------|----------------|---------------------------------------|----------|----------|
| 34 | 13000 D | Expansion plug, 1-1/8" | 14 | .015 | 50 | 32283 DBR | Bearing, rear. | 1 | .250 |
| 35 | ..... | Plug, 1/2" | 1 | .015 | 51 | 32282 DCR | Bearing, No. 3 | 1 | .295 |
| 36 | 31536 DB | Spark plug (Champion 44) (optional) | 6 | .250 | 52 | 32281 DBR | Bearing, No. 2 | 1 | .328 |
| 38 | 32713 DA | Spark plug (AC-18) (optional) | 6 | .250 | 53 | 32280 DCR | Bearing, front. | 1 | .312 |
| 39 | 32445 D | Valve lever bracket stud (short) | 3 | .031 | 54 | 13055 D | Key (Woodruff No. 6) | 1 | .062 |
| 40 | Q 1905 | Hex.nut, 3/8" N.F. | 6 | .125 | 55 | 32090 DD | Cylinder head gasket ring. | 6 | |
| 41 | 32448 D | Bracket stud, intermediate | 2 | .187 | 56 | 67228 D | (Set of 6) cylinder head gasket rings | 1 | .029 |
| 42 | Q 1909 | Hex.nut, 1/2" N.F. | 2 | .069 | 57 | 56464 D | Camshaft | 1 | 27.500 |
| 43 | 5967 DAXA | Cylinder head, front (less valves) | 1 | 135.000 | 58 | 5960 D | Plate | 1 | .500 |
| 44 | 5967 DAYA | (Includes studs and valve guides) | 1 | | 59 | Q 1850 | Cap screw, 1/2 x 1-1/4" N.C. | 2 | .120 |
| 45 | 32444 D | Valve lever bracket stud | 6 | .125 | 60 | Q 1922 | Lock washer, 1/2" | 2 | .013 |
| 46 | Q 1905 | Hex.nut, 3/8" N.F. | 6 | .031 | 61 | 32284 DB | Gear (54 teeth) | 1 | 5.250 |
| 47 | 54158 D | Nozzle body stud | 6 | .250 | 62 | 58253 D | Nut lock | 1 | .062 |
| 48 | 32448 D | Bracket stud, intermediate | 1 | .187 | 63 | 32485 D | Valve spring collar key | 1 | .187 |
| 49 | ..... | See detail illustration | 12 | | 64 | 32486 DAX | Push rod | 24 | .007 |
| 50 | 32445 D | Valve lever bracket stud (short) | 2 | .031 | 65 | 42748 DA | Upper seat | 12 | .437 |
| 51 | 32454 D | Gasket, front and rear | 31 | .125 | 66 | 18539 D | Retainer | 12 | .125 |
| 52 | 32455 D | Center stud washer | 1 | .750 | 67 | 61808 D | Valve spring | 12 | .000 |
| 53 | | | | | 68 | 18746 DA | Lower seat | 12 | .375 |
| 54 | | | | | 69 | 5025 DBR | Valve guide | 12 | .015 |
| 55 | | | | | 70 | 4988 D | Guide | 12 | .343 |
| 56 | | | | | 71 | 32482 DB | Exhaust valve | 12 | 1.750 |
| 57 | | | | | 72 | 42747 D | Intake valve | 6 | .482 |
| 58 | | | | | 73 | 25043 DB | Valve tappet | 6 | .562 |
| 59 | | | | | 74 | 13083 D | Expansion plug, 3/4" | 12 | .420 |
| 60 | | | | | 75 | 28813 D | Valve housing cap screw gasket | 2 | .012 |
| 61 | | | | | 76 | 31121 D | Nozzle body stud nut | 1 | .187 |
| 62 | | | | | 77 | 50410 DA | Oil header plug | 12 | .062 |
| 63 | | | | | 78 | 50677 D | Manifold stud | 1 | .250 |
| 64 | | | | | 79 | Q 1910 | Hex.nut, 1/2" N.C. | 16 | .010 |
| 65 | | | | | 80 | | | 16 | .069 |

SPARE PARTS CATALOG

FUEL OIL FILTER AND LUBRICATING OIL FILTER

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 1 | 39677 D | Bleeder | 1 | .031 |
| 2 | 39577 DA | Stud. | 1 | 1.187 |
| 3 | 13839 D | Stud gasket | 1 | .005 |
| 4 | 28772 D | Case. | 1 | 3.312 |
| 5 | 29501 DA | Cloth element | 1 | 2.562 |
| 6 | 28809 D | Metal element | 1 | .482 |
| 7 | 13841 D | Gasket. | 1 | .010 |
| 8 | 5990 DAX | Base with bar assembly and pipe plug | 1 | 21.000 |
| ... | Q 4048 | Cap screw, 1/2 x 4-3/4" N.C. | 2 | .314 |
| ... | Q 1852 | Cap screw, 1/2 x 1-1/2" N.C. | 2 | .134 |
| ... | Q 1922 | Lock washer, 1/2" | 4 | .013 |
| ... | ..... | Headless ctsk. pipe plug, 3/8" | 1 | 1.000 |
| 9 | 42356 DA | Cover assembly. | 2 | .005 |
| 10 | 42371 DA | Cover gasket. | 2 | .625 |
| 11 | 42366 D | Absorption element. | 2 | 1.000 |
| 12 | 41747 DX | Bar assembly. | 2 | 2.250 |
| 13 | 42369 DA | Plate. | 2 | .107 |
| 14 | 42372 D | Case assembly | 2 | .250 |
| 15 | 41746 D | Gasket. | 2 | .125 |
| 16 | 50410 DA | Plug. | 1 | .002 |
| 17 | 42368 D | Drain plug. | 1 | |
| 18 | 42367 D | Drain plug gasket. | 2 | |
| 19 | 41745 DAX | Lubricating oil filter includes ref. nos. 9, 10, 11, 12, 13, 14, 15, 17, 18 | 2 | |
| 21 | 9982 T | Drain cock. | 1 | 6.500 |
| 22 | 42959 DA | Base gasket | 1 | .062 |

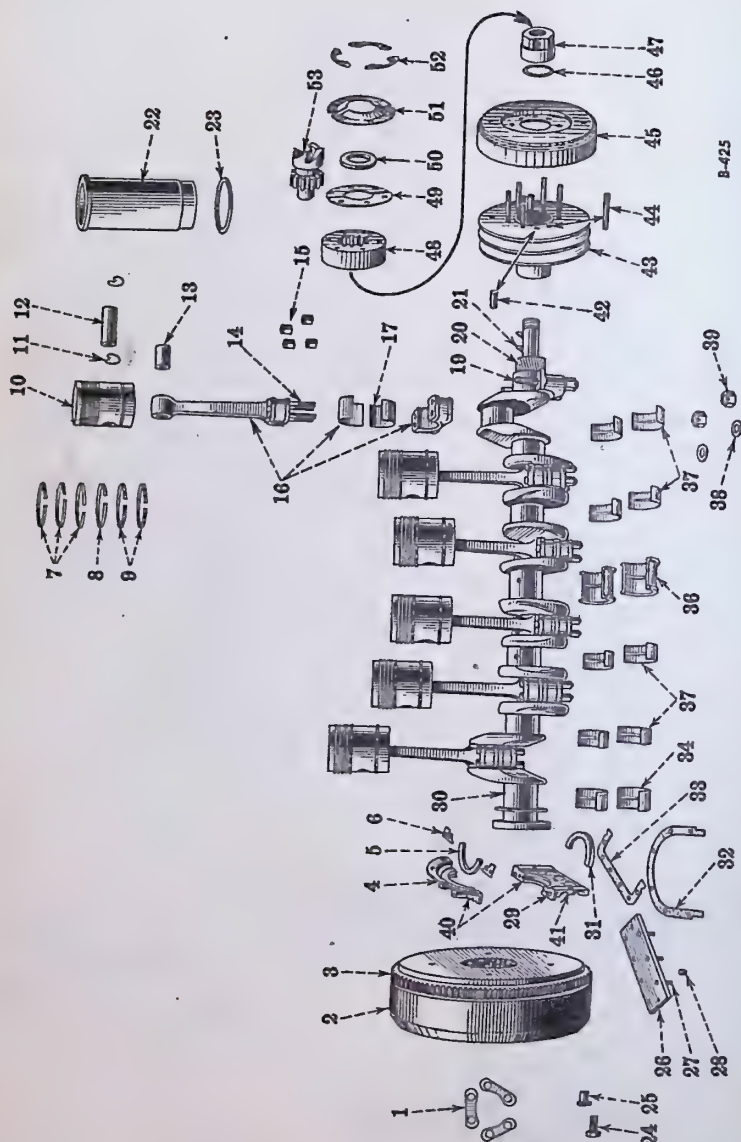
When ordering, always use I H C Part Nos.



Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

CRANKSHAFT, PISTONS, PISTON RINGS, ETC.



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

CRANKSHAFT, PISTONS, PISTON RINGS, ETC. - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|---|--|----------|----------|
| ... | * 42695 DA or † 64440 D | Cylinder sleeve and packing ring with piston, rings, pin, and pin retainers. | 6 | 26.000 |
| ... | * 42696 DA or † 64441 D | (Set of 6) cylinder sleeves and packing rings with pistons, rings, pins, and pin retainers . | 1 | 141.000 |
| 1 | 24943 D | Bolt lock | 3 | .031 |
| 2 | 5958 DAX | Flywheel with ring gear | 1 | 310.000 |
| 3 | 31208 H | Flywheel ring gear (158 teeth) | 1 | 8.750 |
| 4 | 4993 DA | Crankshaft rear oil seal upper retainer | 1 | 2.125 |
| 5 | 32307 DB | Oil seal felt | 1 | .062 |
| 6 | 32308 D | Retainer gasket | 2 | .003 |
| 7 | 31458 D | Piston ring - compression (plain) | 18 | .078 |
| 8 | 42694 D | Piston ring - compression (taper face) | 6 | .078 |
| 9 | 42219 D | Piston ring - oil regulating | 12 | .107 |
| | * 5957 DAX or † 9323 DX * 5957 DAY | Piston with pin and pin retainers | 6 | 6.187 |
| 10 | † 9323-DY or † 64444 D | Piston with pin, pin retainers, and rings | 6 | 7.250 |
| | † 64445 D | (Set of 6) pistons with pins, pin retainers and rings. | 1 | .020 |
| 11 | 26916 D | (Set of 6) pistons with pins and pin retainers. . | 12 | 1.232 |
| 12 | 53612 D | Retainer ring | 6 | .218 |
| 13 | 32942 D | Piston pin (.005" oversize) | 6 | .312 |
| 14 | 28737 DX | Connecting rod bushing. | 24 | .002 |
| | 28737 DX | Bolt with nut | 24 | .062 |
| 15 | 28738 D | Cotter, 3/32 x 1" | 24 | 11.000 |
| 16 | 42687 DAX | Nut | 6 | 11.000 |
| | 42687 DAY | Rod, with bushing | 6 | .875 |
| 17 | 42698 DAX | Rod, with bushing and bearing | 6 | .937 |
| | 42698 DAX | Rod bearing (.020" undersize) {two halves} | 6 | .875 |
| 19 | 64368 DX | Rod bearing (.003" undersize) {two halves} | 16 | .875 |
| ... | 43113 D | Stud. | 16 | .005 |
|  | ..... | Cotter, 1/8 x 1-3/8" | | |

(Continued on next page)

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

CRANKSHAFT, PISTONS, PISTON RINGS, ETC. - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 20 | 25134 DA | Gear (27 teeth) | 1 | 1.593 |
| 21 | 47487 D | Key (Woodruff No. 23) | 2 | .003 |
| 22 | 3202 DCRX | Sleeve with ring. | 6 | 15.250 |
| 23 | 4322 D | Ring. | 6 | .031 |
| 24 | 32333 D | Bolt, 5/8" | 6 | .250 |
| 25 | 32332 D | Dowel pin. | 2 | .125 |
| 26 | 32310 DX | Plate with studs. | 1 | 2.625 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 4 | .052 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| 27 | 32311 D | Plate stud. | 2 | .062 |
| 28 | 25093 DA | Felt plug. | 2 | .001 |
| 29 | 25076 D | Dowel. | 2 | .062 |
| 30 | 32288 DAX | Crankshaft with nut | 1 | 225.000 |
| 31 | 32305 DAX | Crankshaft with nut (.030" undersize) | 1 | 225.000 |
| 32 | 32307 DA | Oil seal felt. | 1 | .062 |
| 33 | 32309 D | Oil seal gasket. | 1 | .006 |
| ... | 32312 D | Plate gasket. | 1 | .006 |
| ... | 47756 DX | Front bearing (standard) (two halves) | 1 | .890 |
| 34 | 47760 DX | Front bearing (.030" undersize) (two halves) | 1 | 1.062 |
| ... | 64369 DX | Front bearing (.003" undersize) (two halves) | 1 | 1.062 |
| ... | 47759 DX | Rear bearing (standard) (two halves) | 1 | 1.062 |
| ... | 47763 DX | Rear bearing (.030" undersize) (two halves) | 1 | 1.156 |
| ... | 64370 DX | Rear bearing (.003" undersize) (two halves) | 1 | 1.062 |
| 36 | 63327 DX | Center bearing (standard) (two halves) | 1 | 2.156 |
| ... | 63328 DX | Center bearing (.030" undersize) (two halves) | 1 | 1.156 |
| ... | 64371 DX | Center bearing (.003" undersize) (two halves) | 1 | 1.062 |
| ... | 47757 DX | Intermediate bearing, complete (two halves) | 4 | .912 |
| 37 | 47761 DX | Intermediate bearing (.030" undersize) (two halves) | 4 | 1.000 |
| ... | 64372 DX | Intermediate bearing (.003" undersize) (two halves) | 4 | 1.000 |
| 38 | 39422 D | Washer. | 16 | .041 |
| 39 | 39423 D | Stud nut. | 16 | .170 |
| 40 | 39401 D | Oil seal retainer. | 1 | 4.625 |
| ... | Q 4018 | Cap screw, 3/8 x 3-1/2" N.C. | 2 | .131 |
| ... | ..... | Washer, 13/32 I.D. x 3/4" O.D. x 14 gage. | 8 | .068 |
| ... | ..... | Cap screw, 3/8 x 1-3/8" N.C. | 6 | .005 |
| ... | Q 1920 | Lock washer, 3/8" | 8 | .005 |

Don't order parts from the illustrations only; refer to the list also.

CRANKSHAFT, PISTONS, PISTON RINGS, ETC. - Continued

| | | | | |
|-----|----------|---|---|--------|
| 41 | 4994 DAX | Crankshaft rear oil seal lower retainer | 1 | 2.750 |
| 42 | 47490 D | Pin | 2 | |
| 43 | 6517 DX | Pulley with drive pins | 1 | |
| 44 | 47489 D | Stud | 6 | |
| 45 | Q 1905 | Hex. nut, 3/8" N.F. | 6 | .031 |
| 46 | 36794 D | Vibration damper | 1 | 16.000 |
| 47 | 18767 D | Lock washer | 1 | .062 |
| 48 | 6516 D | Nut | 1 | |
| 49 | 47488 D | Coupling (11 teeth) | 1 | |
| 50 | 47491 D | Shaft retainer | 2 | |
| 51 | 47492 D | Felt washer | 1 | |
| 52 | 47493 D | Felt retainer | 2 | |
| 53 | 36795 DA | Lock | 3 | .062 |
| ... | 57624 D | Starting crank adapter | 1 | |
| ... | 63282 D | Crankshaft center bearing dowel | 2 | .010 |
| ... | P0 9696 | Crankshaft gear key | 1 | .031 |

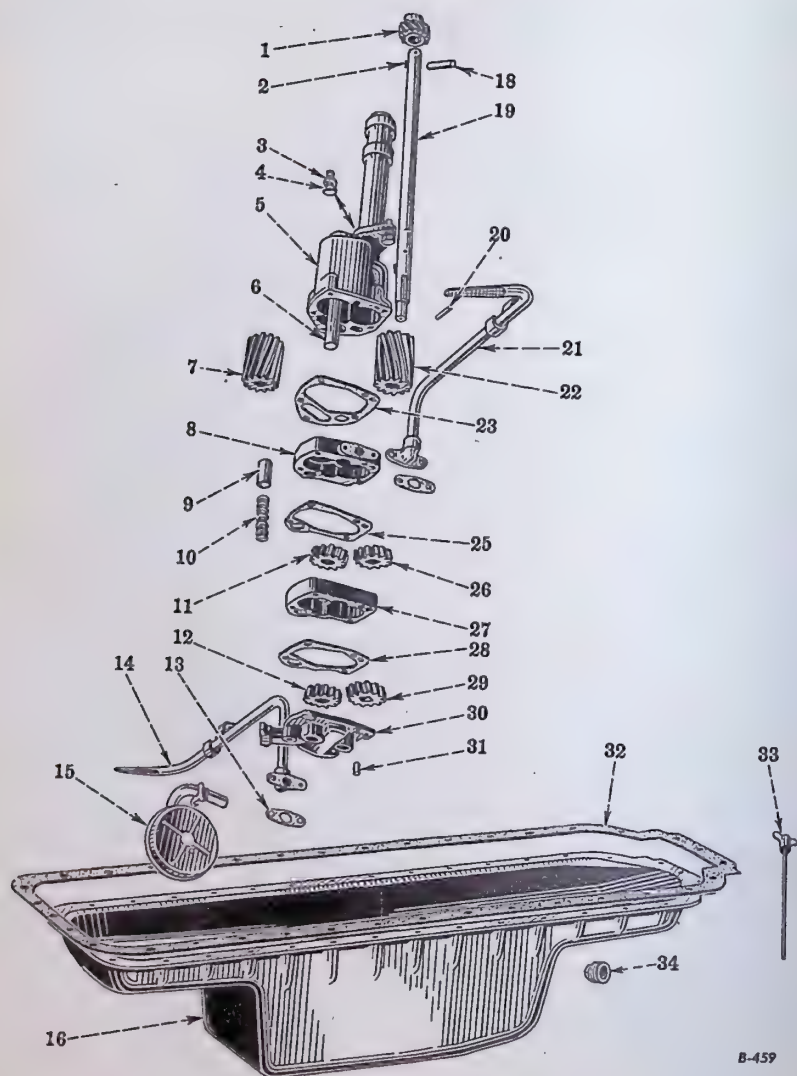
* - Designates aluminum pistons.

† - Designates grey iron pistons.

NOTE: Use only one type of piston (aluminum or grey iron) in any one engine.

SPARE PARTS CATALOG

LUBRICATING OIL PUMP



B-459

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

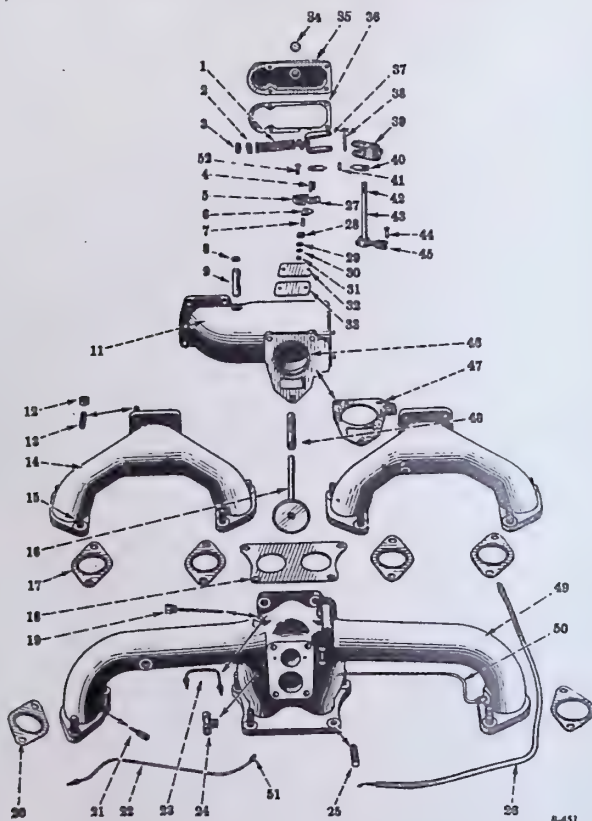
LUBRICATING OIL PUMP - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|---|-------------|-------------|
| ... | 42794 D | Lubricating oil pump (includes Ref. Nos. 1, 2, 5 thru 12, 15, 18, 19, and 22 thru 31) | 1 | 37.000 |
| 1 | 46054 DA | Pinion (14 teeth) | 1 | .625 |
| 2 | 13021 D | Key (Woodruff No.6) | 2 | .004 |
| 3 | Q 1922 | Lock washer, 1/2" | 2 | .013 |
| 4 | 10961 D | Cap screw | 2 | .005 |
| 5 | 5981 DX | Body with shaft | 1 | 8.000 |
| ... | ..... | Countersunk pipe plug, 3/4" | 1 | |
| 6 | 42786 D | Idler gear shaft. | 1 | .452 |
| 7 | 50336 D | Idler gear (12 teeth) | 1 | 2.500 |
| 8 | 5982 DAX | Housing, upper with dowel pin | 1 | 2.937 |
| ... | Q 1808 | Cap screw, 3/8 x 1-3/4" N.C. | 1 | .076 |
| ... | Q 1920 | Lock washer, 3/8" | 1 | .005 |
| 9 | 45285 DA | Regulating valve. | 1 | .10' |
| 10 | 48695 D | Spring. | 1 | .079 |
| 11 | 51516 D | Auxiliary idler gear (12 teeth) | 2 | 7.500 |
| 12 | | | | |
| 13 | 42792 D | Gasket. | 2 | .006 |
| 14 | 43003 DX | Oil return pipe, front. | 1 | 1.000 |
| ... | Q 1774 | Cap screw, 5/16 x 3/4" N.C. | 2 | .033 |
| ... | Q 1919 | Lock washer, 5/16" | 2 | .003 |
| 15 | 42791 DA | Float. | 1 | .698 |
| ... | ..... | Cotter, 1/8 x 1-1/2" | 1 | .005 |
| 16 | 64047 D | Crankcase oil pan, with magnetic drain plug | 1 | 108.000 |
| ... | ..... | Cap screw, 3/8 x 1-1/4" N.C. | 32 | .060 |
| ... | Q 1920 | Lock washer, 3/8" | 36 | .005 |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 4 | .031 |
| 18 | 5312 T#3 | Pin | 1 | .005 |
| 19 | 42783 DXB | Shaft with pin. | 1 | 3.375 |
| 20 | 32319 D | Pin | 1 | .062 |
| 21 | 43004 DX | Oil return pipe, rear | 1 | 1.000 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 2 | .045 |
| ... | Q 1920 | Lock washer, 3/8" | 2 | .005 |
| 22 | 50335 D | Body gear (12 teeth). | 1 | 2.562 |
| 23 | 42789 D | Housing gasket, upper | 1 | .003 |
| 24 | 42790 D | Housing gasket, lower | 1 | .003 |
| 25 | 51515 D | Auxiliary body gear (12 teeth). | 1 | .500 |
| 26 | 5983 D | Housing, lower. | 1 | 3.000 |
| 27 | 42790 D | Cover gasket. | 1 | .003 |
| 28 | 51515 D | Auxiliary body gear (12 teeth). | 1 | .500 |
| 29 | 5984 DX | Cover with pin. | 1 | 2.500 |
| 30 | Q 1818 | Cap screw, 3/8 x 3" N.C. | 3 | .115 |
| ... | Q 4019 | Cap screw, 3/8 x 3-3/4" N.C. | 1 | .146 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| 31 | 46052 D | Dowel pin | 1 | .062 |
| 32 | 42715 D | Crankcase oil pan gasket. | 1 | .125 |
| 33 | 42795 DX | Oil level gage. | 1 | .593 |
| 34 | 58960 D | Magnetic drain plug | 1 | .375 |
| ... | 46053 D | Upper housing dowel pin | 1 | .007 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

MANIFOLDS - INTAKE AND EXHAUST



| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|--------------------------|----------------|---|----------|----------|
| ... | 65810 D | Intake manifold and air valve housing (complete with carburetor as listed in Section 8, pages 4 and 5)(Also includes Ref. Nos. 1, 2, 3, 8, 9, 11, 16, 19, 21, 22, 23, 24, 34 thru 43, 46, 47, 49, 50 and 51). | 1 | |
| 1 | 42663 D | Spring. | 1 | .218 |
| 2 | 42665 D | Cup. | 2 | .062 |
| 3 | 42664 D | Washer. | 1 | .125 |
| 4 | 42673 D | Switch contact. | 1 | .012 |
| ... | ..... | Slotted screw, No. 10 32 x 3/8" | 2 | |
| ... | Q 1916 | Lock washer, No. 10 | 2 | |
| 5 | 42674 D | Spring. | 1 | .012 |
| 6 | 42676 D | Insulator | 1 | .006 |
| (Continued on next page) | | | | |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

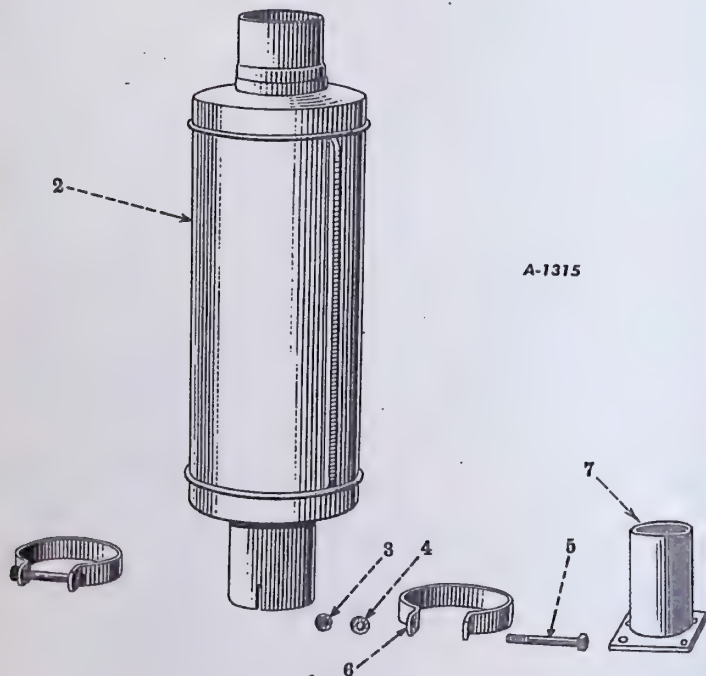
MANIFOLDS - INTAKE AND EXHAUST - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| 7 | 42678 D | Insulating tube. | 1 | .002 |
| 8 | 13090 D | Housing plug | 1 | .015 |
| 9 | 42669 D | Pivot. | 1 | .281 |
| 11 | 5953 DX | Housing (includes Ref. Nos. 8, 46 and 47) | 1 | 19.000 |
| ... | Q 1832 | Cap screw, 7/16 x 1-1/4" N.C. | 3 | .084 |
| ... | Q 1921 | Lock washer, 7/16" | 3 | .01 |
| 12 | ..... | Stud nut (1/2" N.C.) | 8 | .069 |
| 13 | 25122 D | Stud | 8 | .082 |
| 14 | 5046 DBX | Exhaust manifold | 2 | 13.250 |
| 15 | 25125 D | Stud, 1/2" | 8 | .062 |
| 16 | 42660 DA | Air valve. | 1 | .937 |
| 17 | 32360 D | Exhaust gasket | 4 | .062 |
| 18 | 32366 D | Center gasket. | 1 | .062 |
| 19 | 43371 DX | Primer spray tube with nut | 2 | .046 |
| 20 | 32495 D | Intake gasket. | 2 | .062 |
| 21 | 42216 DX | Tube assembly end with nut | 2 | .031 |
| 22 | 43369 DX | Primer pipe, L.H., with nut. | 1 | .010 |
| 23 | 43368 DX | Center pipe with nut | 2 | .010 |
| 24 | 43372 DX | Primer pipe tee. | 2 | .093 |
| 25 | 25125 D | Stud, 1/2" | 8 | .062 |
| | 46886 DX | Short circuiting cable | | |
| | Consists of: | | | |
| | 27618 E | Magneto short circuiting cable loom clamp ring. | 2 | .001 |
| 26 | 38433 D | Magneto short circuiting cable terminal. | 1 | .003 |
| | 29016 H | Magneto short circuiting cable terminal switch end | 1 | .031 |
| 27 | 42675 D | Reinforcement. | 1 | .062 |
| 28 | 42677 D | Insulating washer. | 1 | .004 |
| 29 | ..... | Washer 13/64 I.D. x 1/2" O.D. x 18 ga. | 1 | |
| 30 | Q 1916 | Lock washer, No. 10. | 2 | .003 |
| 31 | ..... | Hex. nut, #10 - 24 N.C. | 2 | .125 |
| 32 | 42679 D | Cover. | 2 | |
| ... | ..... | Slotted screw, No. 10 - 24 x 1/2" | 2 | |
| ... | Q 1916 | Lock washer, No. 10. | 2 | |
| 33 | 42680 D | Gasket | 1 | .012 |
| 34 | 23007 V | Cover plug | 1 | .018 |
| 35 | 5954 DX | Housing cover with plug. | 1 | 2.500 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 4 | .052 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| 36 | 42672 D | Housing gasket | 1 | .012 |
| 37 | 42666 DX | Yoke | 1 | .500 |
| 38 | 42668 DA | Yoke pin | 1 | .045 |
| ... | ..... | Cotter, 1/16 x 5/8" | 2 | |
| 39 | 42670 D | Valve lever, inner | 1 | .500 |
| ... | Q 1802 | Cap screw, 5/16 x 1" N.F. | 1 | .036 |
| ... | Q 1919 | Lock washer, 5/16" | 1 | .003 |
| 40 | 42662 D | Pin retainer | 2 | .062 |
| 41 | 42661 D | Pin. | 1 | .062 |
| 42 | 4167 T | Key. | 2 | .003 |
| 43 | 42671 D | Shaft. | 1 | .375 |
| 44 | 14611 H | Pin. | 2 | .013 |
| 45 | 42782 D | Control lever, outer | 1 | .250 |
| ... | Q 1776 | Cap screw, 5/16 x 1" N.F. | 1 | .036 |
| ... | Q 1919 | Lock washer, 5/16" | 1 | .003 |
| 46 | 42657 D | Ring | 1 | .250 |
| 47 | 42659 D | Gasket | 1 | .012 |
| 48 | 42658 D | Valve sleeve | 1 | .281 |
| 49 | 9561 DX | Intake manifold. | 1 | 30.000 |
| ... | ..... | Headless pipe plug, 1/4" | 1 | |
| 50 | 43370 DX | Primer end pipe, R.H., with nut. | 1 | .031 |
| 51 | 36092 D | Nut. | 2 | .010 |
| 52 | 59247 D | Switch terminal screw. | 1 | .020 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

EXHAUST MUFFLER



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|----------------------------------|-------------|-------------|
| 2 | 40142 D | Muffler | 2 | 5.750 |
| 3 | Q 1903 | Nut, 5/16" N.F. | 2 | .015 |
| 4 | Q 1919 | Lock washer, 5/16" | 2 | .003 |
| 5 | ..... | Bolt, 5/16 x 2-1/4" N.F. | 2 | .070 |
| 6 | U 14284 | Clamp | 2 | .312 |
| 7 | 46644 DX | Exhaust pipe (6" long). | 2 | 1.750 |

When ordering, always use I H C Part Nos.

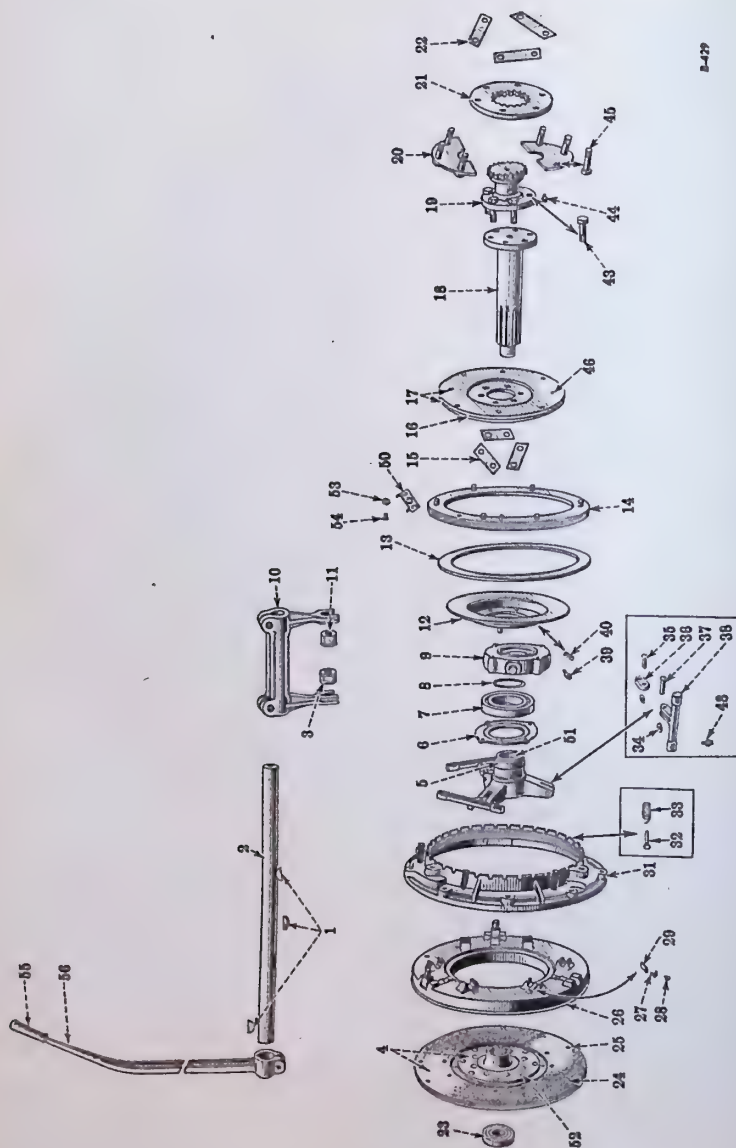
Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

ENGINE CLUTCH

SPARE PARTS CATALOG

ENGINE CLUTCH AND CONNECTIONS



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

SPARE PARTS CATALOG

ENGINE CLUTCH AND CONNECTIONS - Continued

| Ref. No. | I H C Part No. | Rockwell Clutch No. | Engine clutch (17" over-center) complete. (Includes Ref. Nos. 4 thru 9, 12, 13, 14, 24 thru 40 and 48 thru 54.) | No. Used | Wt. Lbs. |
|--------------|----------------|---------------------|---|----------|----------|
| ... | 40938 DE | CLA-1152-AD | Cap screw, 1/2 x 2-1/8" N.C. | 1 | 125.000 |
| ... | Q 1922 | ..... | Lock washer, 1/2" | 9 | .175 |
| ... | Q 1922 | ..... | Lock washer, 1/2" | 9 | .013 |
| 1 | 10430 V | ..... | Key (Woodruff No. 18) | 3 | .062 |
| 2 | 40948 D | ..... | Shaft | 1 | 9.000 |
| 3 | 42298 DB | ..... | Pin bushing | 1 | .125 |
| 4 | 43202 D | UCL-4156 | Driven member assembly | 1 | .500 |
| 5 | 43193 DAX | UCL-4338-1 | Sleeve and bushing | 1 | 7.000 |
| 5,6,7,8,9,12 | 43190 DA | UCL-4338-1A | Sleeve and bearing assembly | 1 | 28.000 |
| 6 | 43201 DA | CL-4257-1 | Plate | 1 | .812 |
| ... | Q 1773 | CL-3919 | Cap screw, 5/16 x 3/4" N.C. | 4 | .033 |
| ... | Q 1919 | CL-3920 | Lock washer, 5/16" | 4 | .003 |
| 7 | 48173 D | ..... | Release bearing (New Departure No. 3214) | 1 | 5.406 |
| 8 | 43195 D | CL-8300 | Ring | 1 | .050 |
| 9 | 43197 DX | UCL-4256 | Carrier | 1 | 13.000 |
| 10 | 5723 DB | ..... | Fork | 1 | 5.500 |
| ... | Q 1874 | ..... | Cap screw, 5/8 x 2" N.C. | 2 | .239 |
| ... | Q 1925 | ..... | Lock washer, 5/8" | 2 | .013 |
| 11 | 42298 DB | ..... | Pin bushing | 2 | .187 |
| 12 | 43198 D | CL-4152 | Disc | 1 | 6.500 |
| ... | Q 1774 | CL-3919 | Cap screw, 5/16 x 3/4" N.C. | 4 | .033 |
| ... | Q 1919 | CL-3920 | Lock washer, 5/16" | 4 | .003 |
| 13 | 43214 D | CL-3904 | Ring plate | 1 | 3.750 |
| 14 | 43212 DEXA | UCL-3897-2 | Adjusting ring | 1 | 8.000 |
| 15 | 40974 DA | ..... | Bolt lock | 3 | .031 |
| 16 | 40943 D | ..... | Facing | 1 | .593 |
| 17 | 40942 DX | ..... | Disc with facing, cp. | 1 | 6.500 |
| 18 | 40941 D | ..... | Clutch shaft | 1 | 10.000 |
| 19 | 40944 DE | ..... | Coupling (18 teeth) | 1 | 5.000 |
| 20 | 40947 D | ..... | Coupling washer | 2 | .750 |
| 21 | 40946 D | ..... | Ring (18 teeth) | 1 | .750 |
| 22 | 41693 DA | ..... | Bolt lock | 3 | .950 |
| 23 | 11669 K | ..... | Bearing (pilot) (New Departure No. 7306) | 1 | 6.031 |
| 24 | 43246 DX | CL-4170 | Facing package (two woven facings) | 1 | .003 |
| 25 | 63385 D | CL-1011-1 | Rivet | 36 | |

(Continued on next page)

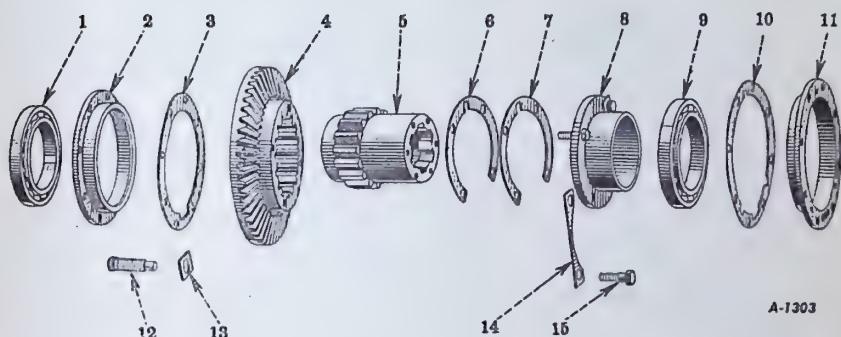
SPARE PARTS CATALOG

ENGINE CLUTCH AND CONNECTIONS - Continued

| Ref. No. | I H C Part No. | Rockford Clutch No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---------------------|---|----------|----------|
| 26 | 43213 DEX | UCL-3894-3 | Plate assembly. | 1 | 59.000 |
| 27 | 54953 D | CL-4799 | Cam block screw lock. | 6 | .003 |
| 28 | ..... | CL-3921 | Screw, 1/4 x 1/2" N.C. | 6 | .016 |
| 29 | 43248 D | 6-CL-3478 | Cam block (set of six) | 1 | .312 |
| 31 | 43208 DCX | UCL-3895-4 | Back plate. | 1 | 26.000 |
| 32 | 61130 D | CL-5328 | Bolt. | 6 | .083 |
| ... | Q 1903 | CL-3336 | Hex. nut, 5/16" N.F. | 6 | .015 |
| 33 | ..... | CL-3926 | Cotter, 1/16 x 1/2" | 6 | .031 |
| 34 | 3217 D | CL-4451 | Spring. | 6 | .001 |
| 35 | 43211 D | CL-4347 | Washer, 3/8 L.D. x 7/8" O.D. x 1/8 ga. | 6 | .003 |
| 36 | 43207 D | CL-4341 | Link pin, long. | 3 | .125 |
| 37 | N 32202 | CL-4597 | Cotter, 1/8 x 5/8" | 3 | .050 |
| 38 | 56996 DX | UCL-1-4337-S3A | Link. | 3 | .003 |
| 39 | Q 3625 | CL-4475 | Link pin, short | 1 | 3.500 |
| 40 | 43199 D | CL-4052 | Cotter, 1/8 x 5/8" | 1 | .031 |
| 43 | 40945 D | ..... | Camshaft (set of three) 6 blocks. | 2 | .125 |
| 44 | Q 1909 | ..... | Lubricator fitting (Lincoln No. 5100) | 6 | .069 |
| 45 | 40945 D | ..... | Dowel pin. | 1 | .125 |
| 46 | 21444 H | ..... | Coupling bolt. | 6 | .015 |
| 48 | Q 3627 | CL-5028 | Hex. nut, 1/2" N.F. | 6 | .069 |
| 50 | 61128 D | CL-5201 | Pilot lubricator (Lincoln No. 5000) | 8 | .003 |
| 51 | 43194 D | CL-4154 | Ring bolt. | 3 | .015 |
| 52 | ..... | ..... | Hex. nut, 1/2" N.F. | 1 | .083 |
| 53 | 27166 H | CL-1808 | Brake disc facing rivet. | 2 | .250 |
| 54 | 61115 D | CL-5215 | Camshaft lubricator fitting (Lincoln No. 5316) | 16 | .041 |
| 55 | 41597 D | ..... | Adjusting lock. | 2 | .156 |
| 56 | 5832 DAX | ..... | Sleeve bushing. | 1 | 5.250 |
| ... | Q 1877 | ..... | Flat head rivet, 3/8 x 3/4" | 1 | .303 |
| ... | Q 1911 | ..... | Adjusting lock screw nut. | 1 | .127 |
| ... | Q 1925 | ..... | Engine clutch lever handle (rubber) (See 9649 DA) | 1 | .013 |
| ... | 43206 DE | UCL-7-3895-4 | Engine clutch lever with rubber handle (See 9649 DA) | 1 | 130.187 |
| ... | 43209 DA | CL-8902 | Engine clutch lever, complete (Steel) (Optional in place of 5832 DAX and 41597 D) | 1 | .375 |
| ... | 3741 T | ..... | Cap screw, 5/8 x 2-1/2" N.F. | 3 | .017 |
| ... | ..... | ..... | Hex. nut, 5/8" N.F. | 3 | ..... |
| ... | ..... | ..... | Lock washer, 5/8" | 3 | ..... |
| ... | ..... | ..... | Clutch, complete, less driven member assembly. | 3 | ..... |
| ... | ..... | ..... | Drive stud. | 3 | ..... |
| ... | ..... | ..... | Drive stud pin. | 3 | ..... |

SPARE PARTS CATALOG

DRIVE BEVEL GEAR



A-1303

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| 1 | 54134 D | Bearing. | 1 | 9.375 |
| 2 | 8531 D | Cage, left hand. | 1 | 7.875 |
| 3 | 51238 D | Gasket | 1 | .050 |
| 4 | 64618 D | Matched set of bevel gear and pinion. (Includes gear (4) illustrated above, also shaft and drive bevel pinion (87) illustrated under Section 14, opposite page 1.) . . | | |
| 5 | 8530 D | Hub. | 1 | |
| 6 | 54128 D | Shim, heavy. | 4 | .090 |
| 7 | 54129 D | Shim, light. | as req'd | .052 |
| 8 | 54130 D | Spacer | 1 | 12.562 |
| 9 | 54134 D | Bearing. | 1 | 9.000 |
| 10 | 51238 D | Gasket | 1 | .017 |
| 11 | 8532 D | Cage, right hand | 1 | 7.250 |
| 12 | 40930 D | Set screw. | 1 | .750 |
| ... | ..... | Hex. jam nut, 1-1/8" | 1 | .465 |
| 13 | 40931 D | Screw lock | 1 | .041 |
| 14 | 54132 DA | Lock | 2 | .062 |
| 15 | 54131 D | Bolt | 4 | .500 |

When ordering, always use I H C Part Nos.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

SPROCKET DRIVE ASSEMBLY



| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|------------------------------------|----------|----------|
| 1 | 41466 DAX | pinion shaft (includes Ref. No. 6) | 2 | 68.000 |
| 2 | 9469 DX | Bearing retainer with oil seal | 2 | 6.750 |
| ... | ..... | Cap screw, 1/2 x 1-3/8" N.C. | 10 | .134 |
| ... | Q 1922 | Lock washer, 1/2" | 10 | .013 |
| 3 | 84811 D | Bearing retainer gasket | 2 | .000 |
| 4 | 41436 D | Oil seal | 2 | .625 |
| 4 | 42289 D | Bearing (New Departure No. 7516) | 2 | 3.156 |
| 5 | 41464 D | Bearing nut | 2 | 1.500 |
| 6 | 10782 D | Lock bolt | 4 | .031 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

SPROCKET DRIVE ASSEMBLY - Continued

| | | | | |
|-----|----------|--|----|---------|
| 11 | 16135 B | Bearing (New Departure No. 1219) | 3 | 7.108 |
| 12 | 64497 D | Sprocket drive pinion (13 teeth) | 2 | 18.000 |
| 15 | 16135 B | Bearing (New Departure No. 1219) | 2 | 7.100 |
| 16 | 64807 D | Packing ring | 2 | .040 |
| 17 | 9468 DX | Cap with packing ring | 2 | 9.500 |
| ... | ... | Cap screw, 1/2 x 1-3/8" N.C. | 12 | .134 |
| ... | Q 1922 | Lock washer, 1/2" | 12 | .013 |
| 18 | 64903 D | Pin | 4 | .250 |
| 20 | 64499 DA | Gear (68 teeth) and carrier (includes Ref. No. 46) | 2 | 261.000 |
| ... | ... | Round head rivet, 5/8 x 2-1/2" | 24 | 10.812 |
| 21 | 41890 D | Spacer, long | 2 | .200 |
| 22 | 64812 D | Gasket | 2 | 200.000 |
| ... | 9471 DX | Cover with anchor pins | 2 | .281 |
| ... | Q 1909 | Cap screw, 5/8 x 2-1/8" N.F. | 20 | .069 |
| ... | Q 1911 | Hex. nut, 1/2" N.F. | 28 | .127 |
| ... | Q 1922 | Hex. nut, 5/8" N.F. | 20 | .013 |
| ... | Q 1911 | Lock washer, 1/2" | 20 | .162 |
| ... | Q 1855 | Lock washer, 5/8" | 28 | .250 |
| ... | 64904 D | Cap screw, 1/2 x 2" N.F. | 4 | .187 |
| ... | 64802 D | Dowel pin | 24 | .500 |
| 25 | 41805 D | Retainer | 24 | .017 |
| ... | Q 4000 | Cap screw, 1/4 x 5/8" N.C. | 24 | .156 |
| ... | Q 1918 | Lock washer, 1/4" | 2 | 6.500 |
| 26 | 41604 D | Diaphragm | 24 | .045 |
| 27 | 41610 D | Guard | 24 | .005 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 24 | 11.875 |
| ... | Q 1920 | Lock washer, 3/8" | 2 | .375 |
| 28 | 5833 D | Pressure plate | 2 | 4.500 |
| 29 | 41609 D | Packing | 2 | 6.500 |
| 30 | 41606 D | Deflector | 2 | .031 |
| 31 | 41882 D | Carrier | 2 | 315.000 |
| 32 | 40999 D | Ring (track frame pivot shaft) | 1 | .238 |
| 33 | ... | Plug, 1-1/2" | 14 | .013 |
| ... | 9473 DX | Carrier with pipe plugs | 2 | ... |
| ... | Q 1872 | Cap screw, 5/8 x 1-3/4" N.C. | 22 | ... |
| 34 | Q 1925 | Lock washer, 5/8" | 2 | ... |
| ... | ... | Standard ctsk. head pipe plug, 3/4" | 2 | ... |
| ... | ... | Standard ctsk. head pipe plug, 1-1/2" | 2 | ... |
| ... | ... | Plug, 3/4" | 2 | ... |
| 35 | ... | Spacer, short | 2 | ... |
| 36 | 41889 D | Bearing (New Departure No. 1222-100) | 2 | .343 |
| 37 | 41877 D | Bearing (New Departure No. 1222-100) | 2 | 12.281 |

(Continued on next page)

SPARE PARTS CATALOG

SPROCKET DRIVE ASSEMBLY - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 41 | 52419 D | Anchor pin. | 4 | .100 |
| 42 | 41608 D | Spring. | 12 | .041 |
| 43 | 41876 DA | Bolt. | 16 | .750 |
| 44 | 6666 DA | Sprocket (29 teeth) | 2 | 263.000 |
| 45 | 41878 D | Lock. | 2 | .625 |
| 46 | 41879 DA | Nut. | 2 | 3.375 |
| 47 | 41893 D | Gasket. | 2 | .625 |
| 48 | 5834 D | Pressure plate. | 2 | 6.000 |
| 49 | 41612 D | Diaphragm. | 2 | .140 |
| 50 | 41613 D | Retainer. | 2 | .500 |
| ... | Q. 4000 | Cap screw, 1/4 x 5/8" N.C. | 16 | .017 |
| ... | Q. 1918 | Lock washer, 1/4" | 16 | |
| 51 | 5728 DA | Bracket. | 2 | 33.500 |
| ... | Q. 1889 | Cap screw, 3/4 x 2" N.F. | 6 | .384 |
| ... | Q. 1891 | Cap screw, 3/4 x 2-1/4" N.F. | 4 | .415 |
| ... | Q. 1913 | Hex. nut, 3/4" N.F. | 10 | |
| ... | Q. 1927 | Lock washer, 3/4" | 10 | |
| 52 | 40997 DA | Track frame pivot shaft. | 1 | 325.000 |
| 53 | 5727 DA | Pivot bearing. | 1 | 14.000 |
| ... | Q. 1889 | Cap screw, 3/4 x 2" N.F. | 8 | .384 |
| ... | Q. 1927 | Lock washer, 3/4" | 8 | |
| 54 | 40990 D | Gasket (track pivot). | 2 | .250 |
| 55 | 5729 DAX | Cap (track pivot). | 2 | 16.000 |
| ... | Q. 1890 | Cap screw, 3/4 x 2" N.C. | 8 | .384 |
| ... | Q. 1927 | Lockwasher, 3/4" | 8 | |
| 56 | Q. 3615 | Lubricator (track pivot) (Lincoln No. 5000) | 2 | .015 |
| 57 | 41886 DX | Shield (sprocket). | 2 | 28.000 |
| ... | ..... | Cap screw, 5/8 x 1-5/8" N.F. | 8 | .238 |
| ... | Q. 1911 | Hex. nut, 5/8" N.F. | 8 | .127 |
| ... | Q. 1925 | Lock washer, 5/8" | 8 | .013 |
| ... | Q. 1864 | Cap screw, 1/2 x 3" N.C. | 4 | .217 |
| ... | Q. 1922 | Lock washer, 1/2" | 4 | |
| 59 | 5876 DA | Cage. | 2 | 14.250 |
| 60 | 16135 H | Bearing (New Departure No. 1219 YL) | 2 | 7.100 |
| ... | Q. 1893 D | Gasket. | 2 | .625 |
| 62 | 41881 D | Retainer. | 2 | 8.500 |
| 63 | 41894 D | Deflector (track frame). | 2 | 2.250 |
| ... | Q. 1855 | Cap screw, 1/2 x 2" N.F. | 16 | .162 |
| ... | Q. 1925 | Lock washer, 1/2" | 16 | .013 |
| 64 | 41618 D | Packing. | 2 | .375 |

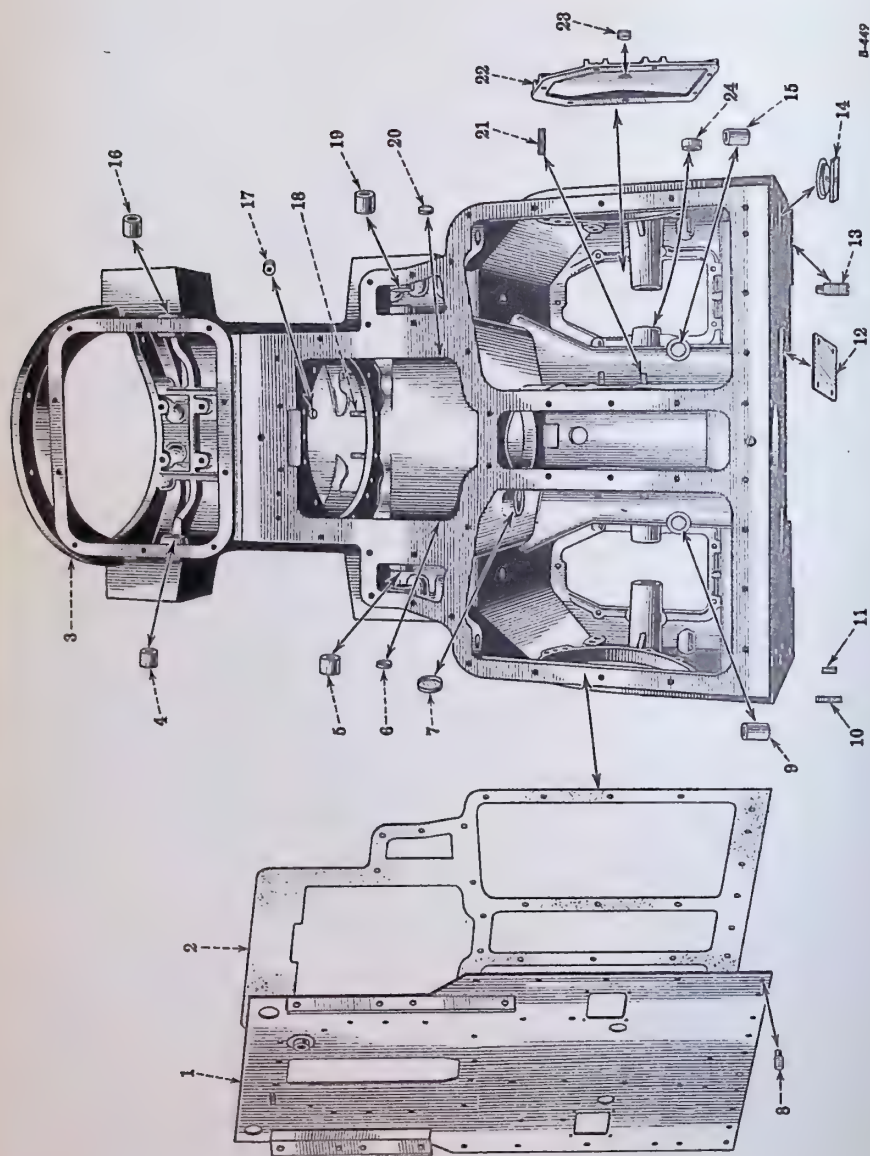
SPARE PARTS CATALOG

SPROCKET DRIVE ASSEMBLY - Continued

| | | | | |
|-----|----------|--|----|-------|
| 65 | 41619 D | Spring | 8 | .031 |
| 66 | 41620 D | Guard | 2 | 3.500 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 16 | .107 |
| ... | Q 1920 | Lock washer, 3/8" | 16 | .005 |
| 67 | 54110 D | Anchor pin | 4 | .028 |
| 68 | 40998 DA | Pivot shaft set screw | 2 | .125 |
| ... | ..... | Hex. jam nut, 3/4" N.C. | 2 | .265 |
| ... | 41842 D | Sprocket carrier bolt nut | 16 | .010 |
| ... | 61913 D | Sprocket carrier bolt lock washer (Shakeproof No. 1134) | 16 | .125 |
| ... | 64809 D | Sprocket drive carrier stud nut | 16 | .013 |
| ... | Q 1925 | Lock washer, 5/8" | 16 | .218 |
| ... | 64810 D | Sprocket drive carrier and cover stud | 16 | .004 |
| ... | 47415 H | Sprocket drive carrier lock washer (Shakeproof No. 1128) | 8 | |

SPARE PARTS CATALOG

MAIN FRAME AND COVERS



B-449

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

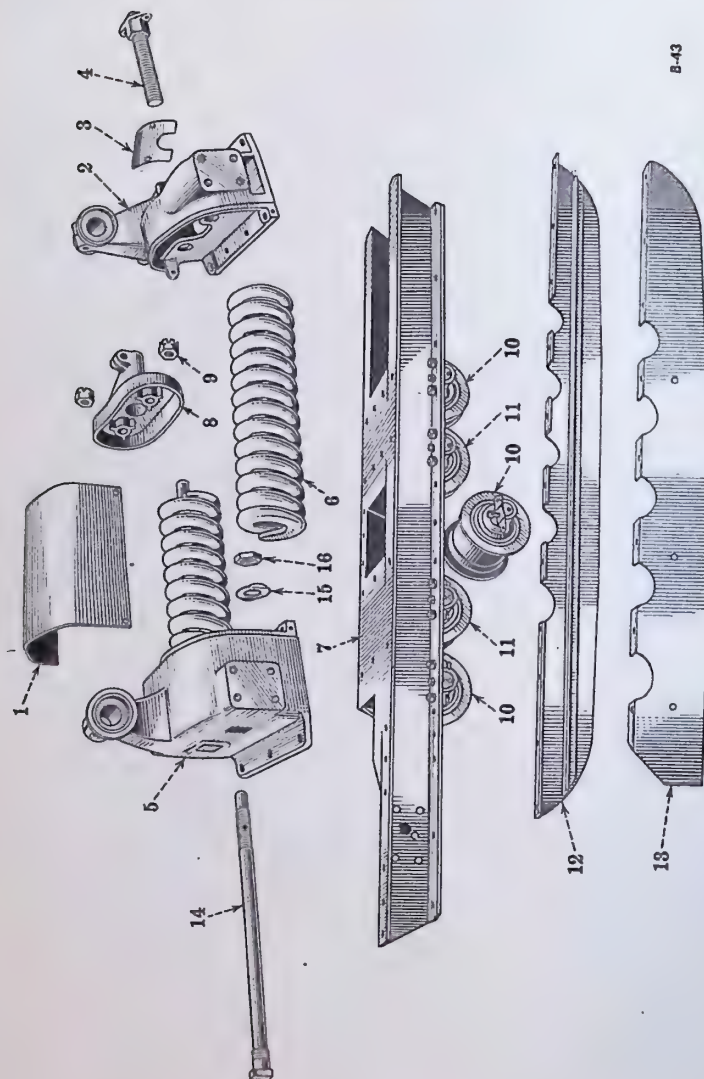
SPARE PARTS CATALOG

MAIN FRAME AND COVERS - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|--|----------|----------|
| 1 | 57100 DXA | Main frame cover, complete | 1 | | 17 | ..... | Socket head pipe plug, 1-1/2" | 1 | |
| ... | Q 1850 | Cap screw, 1/2 x 1-1/4" N.C. | 38 | .120 | 18 | 41957 D | Transmission end cover stud | 4 | .125 |
| ... | Q 1922 | Lock washer, 1/2" | 38 | .013 | 19 | 41599 D | Steering brake lever outer bushing | 2 | .093 |
| 2 | 42552 D | Frame cover gasket | 1 | .750 | 20 | 41600 D | Steering brake operating shaft plug | 1 | .025 |
| 3 | 5900 DJX | Main frame | 1 | 2220.000 | 21 | 40932 D | Bevel gear bearing cage stud | 4 | .250 |
| ... | ..... | Socket head pipe plug, 1-1/2" | 1 | | 22 | 5803 DA | Steering brake inspection cover | 2 | 17.500 |
| 4 | 41598 D | Engine clutch release shaft bushing | 1 | .156 | ... | Q 1852 | Cap screw, 1/2 x 1-1/2" N.C. | 14 | .134 |
| 5 | 41599 D | Steering brake lever outer bushing | 2 | .093 | ... | Q 1922 | Lock washer, 1/2" | 14 | .013 |
| 6 | 41600 D | Steering brake operating shaft plug | 1 | .025 | 23 | 4296 DA | Drain plug | 2 | |
| 7 | 46369 D | Reverse idler shaft plug | 1 | .187 | 24 | 41162 D | Brake pivot shaft cup plug | 2 | .062 |
| 8 | 18585 DA | Frame cover dowel pin | 2 | .125 | ... | 56011 D | Steering clutch inspection cover | 2 | 1.000 |
| 9 | 42000 D | Steering clutch release shaft bushing | 1 | .125 | ... | Q 1771 | Cap screw, 5/16" x 1/2" N.F. | 8 | .025 |
| 10 | 57387 D | Drawbar guide bracket stud, upper | 2 | 1.000 | ... | Q 1919 | Lock washer, 5/16" | 8 | .003 |
| 11 | 57386 D | Drawbar guide bracket stud, lower | 4 | 1.000 | ... | 56014 D | Steering clutch inspection cover | 2 | .025 |
| 12 | 42290 D | Main frame rear inspection cover | 2 | 1.000 | ... | 58989 D | Magnetic transmission drain plug, 1-1/2" | 1 | .750 |
| ... | Q 1800 | Cap screw, 3/8" x 3/4" N.C. | 8 | .045 | ... | 58997 D | Sprocket drive carrier magnetic drain plug | 2 | .077 |
| ... | Q 1920 | Lock washer, 3/8" | 8 | .005 | ... | ..... | Socket head pipe plug, 3/4" | 2 | |
| 13 | 40998 DA | Track frame pivot shaft set screw | 2 | .250 | ... | 63978 D | Steering brake inspection cover | 2 | .100 |
| ... | ..... | Hex jam nut, 3/4" N.C. | 2 | | ... | 4296 DA | Engine clutch cover gasket | 2 | |
| 14 | 42297 D | Steering clutch lubricating port cover | 2 | .531 | ... | 42988 D | Power take-off cover | 1 | |
| 15 | 42000 D | Steering clutch release shaft bushing | 1 | .125 | ... | Q 1884 | Cap screw, 3/4" x 1-1/4" N.C. | 1 | |
| 16 | 41598 D | Engine clutch release shaft bushing | 1 | .125 | ... | Q 1927 | Lock washer, 3/4" | 6 | .290 |
| | | | | | ... | 42289 D | Power take-off cover gasket | 6 | .045 |
| | | | | | ... | | | 1 | .062 |

SPARE PARTS CATALOG

TRACK FRAME AND SPRINGS



B-43

SPARE PARTS CATALOG

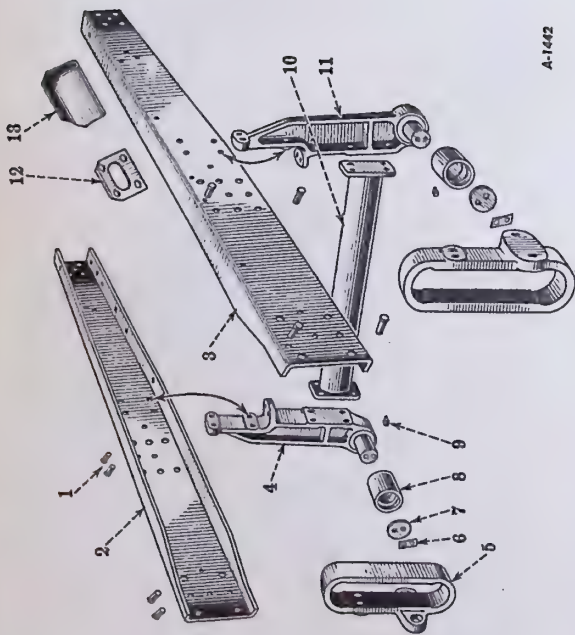
TRACK FRAME AND SPRINGS - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|----------|----------------|--|----------|----------|
| * 1 | 41846 D | Guard. | 2 | 24.000 | ... | Q 1927 | Lock washer, 3/4" | 2 | .045 |
| ... | Q 1922 | Lock washer, 1/2" | 8 | .013 | 6 | Q 1929 | Lock washer, 7/8" | 12 | .050 |
| ... | ... | Washer, 17/32 I.D. x 1" O.D. x No. 14 gage. | 8 | | 7 | 41843 DA | Spring | 4 | 142.000 |
| ... | Q 1848 | Cap screw, 1/2 x 1" N.C. | 8 | .106 | ... | { 52424 DD | Frame, complete, L.H. | 1 | 440.000 |
| * 2 | { 5866 DEX | Spring guide, L.H. | 1 | 126.000 | ... | { 52425 DD | Frame, complete, R.H. | 1 | 440.000 |
| ... | { 5867 DEX | Spring guide, R.H. | 1 | 126.000 | 8 | 5865 DA | Retainer, front. | 2 | 46.500 |
| ... | Q 4138 | Cap screw, 3/4 x 4-1/4" N.F. | 2 | .665 | ... | Q 4134 | Cap screw, 3/4 x 3-1/4" N.F. | 2 | .540 |
| ... | Q 1897 | Cap screw, 7/8 x 1-3/4" N.F. | 8 | .496 | ... | Q 1927 | Lock washer, 3/4" | 2 | .201 |
| ... | Q 4166 | Cap screw, 7/8 x 2-3/4" N.F. | 4 | .666 | 10 | Q 1913 | Hex. nut, 3/4" N.F. | 2 | |
| ... | Q 4168 | Cap screw, 7/8 x 3-1/4" N.F. | 4 | .751 | 11 | 56133 D | Track roller, complete less bracket (Nos. 1, 3, and 5) (See details on Page 2, Section 12) | 6 | 120.000 |
| ... | Q 1913 | Hex. nut, 3/4" N.F. | 2 | .201 | ... | { 46683 DAX | Shield, outer, R.H. | 4 | 124.000 |
| ... | Q 1927 | Lock washer, 3/4" | 2 | .313 | 12 | { 46684 DAX | Shield, inner, L.H. | 1 | 90.000 |
| ... | Q 1929 | Lock washer, 7/8" | 16 | .500 | ... | Q 1873 | Cap screw, 5/8 x 2" N.F. | 24 | .259 |
| 3 | 41845 D | Cover plate. | 2 | .041 | ... | Q 1911 | Hex. nut, 5/8" N.F. | 24 | .127 |
| ... | Q 4016 | Cap screw, 3/8 x 5/8" N.C. | 4 | .005 | ... | Q 1925 | Lock washer, 5/8" | 24 | .013 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | 14.000 | 13 | { 46681 DAX | Shield, inner, L.H. | 1 | 75.000 |
| 4 | 41853 DB | Idle adjuster. | 2 | | ... | { 46682 DAX | Shield, inner, R.H. | 1 | 75.000 |
| ... | ... | Cadmium plated cap screw, 5/8 x 1-1/2" N.F. | 4 | | ... | Q 1873 | Cap screw, 5/8 x 2" N.F. | 16 | .259 |
| ... | ... | Cadmium plated lock washer, 5/8" | 4 | 152.000 | ... | Q 1911 | Hex. nut, 5/8" N.F. | 16 | .127 |
| 5 | { 5863 DDX | Retainer, rear, L.H. | 1 | 152.000 | ... | Q 1925 | Lock washer, 5/8" | 16 | .013 |
| ... | { 5864 DDX | Retainer, rear, R.H. | 1 | | 14 | 55359 D | Spring adjusting rod | 4 | 17.000 |
| ... | Q 4140 | Cap screw, 3/4 x 4-3/4" N.F. | 2 | .665 | ... | ... | Cadmium plated castle hex. nut, 1-1/2" N.F. | 4 | |
| ... | Q 1897 | Cap screw, 7/8 x 1-3/4" N.F. | 4 | .496 | ... | ... | Cotter, 3/16 x 2-1/4" | 4 | |
| ... | Q 4166 | Cap screw, 7/8 x 2-3/4" N.F. | 6 | .666 | 15 | 54111 D | Spring adjusting rod | 4 | .250 |
| ... | Q 1913 | Hex. nut, 3/4" N.F. | 2 | .201 | 16 | 46687 D | Spring adjusting rod lock nut | 4 | .375 |
| ... | ... | Hex. nut, 7/8" N.F. | 2 | .313 | | | | | |

* - If the tractor is equipped with a Rigid Track Frame these parts are replaced.

SPARE PARTS CATALOG

TRACK FRAME GUIDE, ROLLER AND BRACKET MAIN FRAME SIDE CHANNEL



| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--------------------------------------|----------|----------|
| 1 | 42293 D | Dowel. | 8 | .250 |
| 2 | 58194 D | Channel, L.H. | 1 | 190.000 |
| ... | Q 4147 | Cap screw, 7/8 x 2-1/4" N.C. | 3 | .581 |
| ... | Q 1929 | Lock washer, 7/8" | 6 | .05 |
| ... | Q 1890 | Cap screw, 3/4 x 2" N.C. | 4 | .384 |
| ... | Q 1927 | Lock washer, 3/4" | 4 | .045 |
| 3 | 52416 D | Channel, R.H. | 1 | 195.000 |
| ... | Q 4147 | Cap screw, 7/8 x 2-1/4" N.C. | 6 | .581 |
| ... | Q 1929 | Lock washer, 7/8" | 6 | .05 |
| ... | Q 1890 | Cap screw, 3/4 x 2" N.C. | 4 | .384 |
| ... | Q 1927 | Lock washer, 3/4" | 4 | .045 |

SPARE PARTS CATALOG

TRACK FRAME GUIDE, ROLLER AND BRACKET MAIN FRAME SIDE CHANNEL - Continued

| | | | | |
|------|-----------|---------------------------------|---|--------|
| * 4 | 5769 DAX | Bracket, complete, L.H. | 1 | .477 |
| ... | ... | Cap screw, 3/4 x 2-5/8" N.F. | 2 | .415 |
| ... | ... | Cap screw, 3/4 x 2-1/8" N.F. | 4 | .201 |
| ... | Q 1913 | Hex. nut, 3/4" N.F. | 6 | .045 |
| ... | Q 1927 | Lock washer, 3/4" | 6 | 48.500 |
| * 5 | 41435 DB | Guide. | 2 | .581 |
| ... | ... | Cap screw, 7/8 x 2-1/8" N.F. | 4 | .05 |
| ... | Q 1929 | Lock washer, 7/8" | 4 | .020 |
| * 6 | 35089 DA | Cap screw lock. | 2 | .500 |
| * 7 | 41431 D | Washer. | 2 | .099 |
| ... | Q 4050 | Cap screw, 1/2 x 7/8" N.F. | 4 | 7.250 |
| * 8 | 41430 D | Roller. | 2 | .015 |
| * 9 | Q 3615 | Lubricator (Lincoln No. 5000). | 2 | 48.000 |
| * 10 | 41433 DAX | Bracket brace. | 1 | .384 |
| ... | Q 1890 | Cap screw, 3/4 x 2" N.C. | 4 | .201 |
| ... | Q 1889 | Cap screw, 3/4 x 2" N.F. | 4 | .045 |
| ... | Q 1913 | Hex. nut, 3/4" N.F. | 8 | 61.500 |
| ... | Q 1927 | Lock washer, 3/4" | 1 | .352 |
| * 11 | 5770 DAX | Bracket, complete, R.H. | 2 | .290 |
| ... | ... | Cap screw, 3/4 x 2-5/8" N.F. | 4 | .201 |
| ... | Q 1913 | Cap screw, 3/4 x 2-1/8" N.F. | 6 | .045 |
| ... | Q 1927 | Hex. nut, 3/4" N.F. | 1 | .133 |
| ... | 50180 D | Lock washer, 3/4" | 2 | .069 |
| ... | ... | Starting crank support plate. | 2 | .013 |
| ... | Q 1909 | Cap screw, 1/2 x 1-3/8" N.F. | 2 | 1.125 |
| ... | Q 1922 | Hex. nut, 1/2" | 1 | .060 |
| ... | 50181 D | Lock washer, 1/2" | 2 | .031 |
| ... | ... | Starting crank support clamp. | 2 | .005 |
| ... | Q 1905 | Cap screw, 3/8 x 1-1/8" N.F. | 4 | .687 |
| ... | Q 1920 | Hex. nut, 3/8" N.F. | 4 | .088 |
| ... | 59237 D | Lock washer, 3/8" | | |
| * | ... | Track frame guide bolt. | | |
| ... | ... | Lock washer, 1". | | |

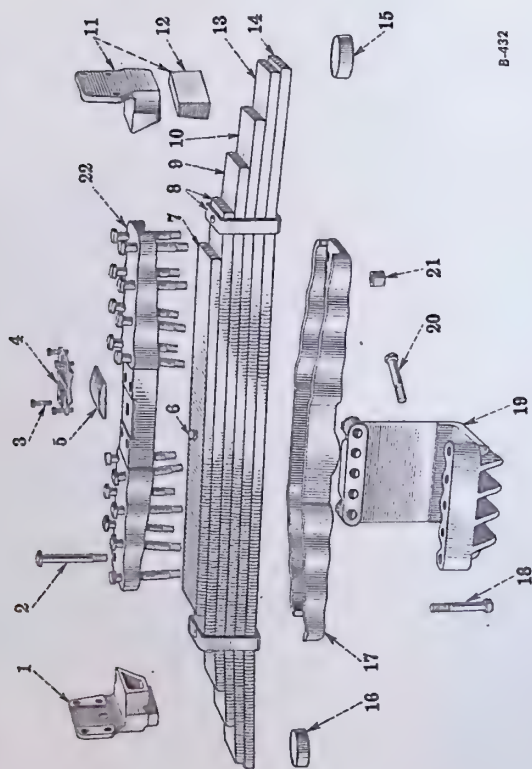
* - If the tractor is equipped with a Rigid Track Frame, these parts are not used.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

EQUALIZER SPRING

Note: If the tractor is equipped with a Rigid Track Frame, the Equalizer Spring is not used.



B-432

SPARE PARTS CATALOG

Frame - 7
Page 7

EQUALIZER SPRING - Continued

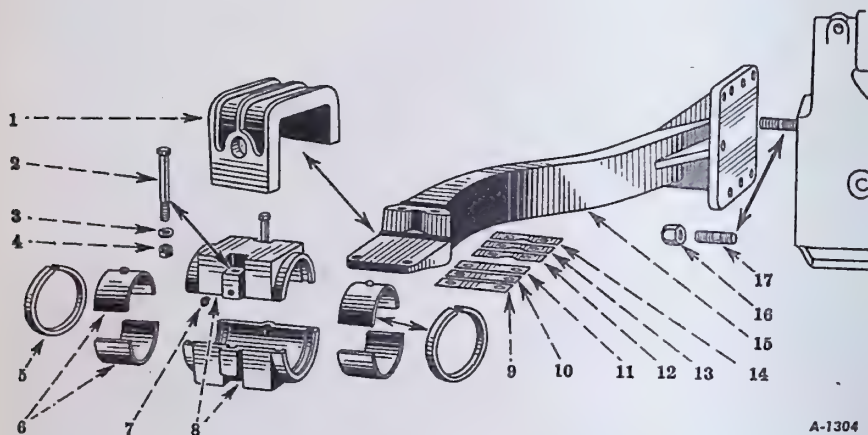
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|-----------------------------------|----------|----------|
| ... | 41439 D | Spring, complete (6 leaves). | 1 | |
| 1 | 8942 DX | Bumper pad bracket with pad, R.H. | 1 | 24.000 |
| ... | Q 4150 | Cap screw, 7/8 x 3" N.C. | 4 | .709 |
| ... | Q 1929 | Lock washer, 7/8" | 4 | .06 |
| 2 | 41441 D | Saddle bolt. | 16 | 2.125 |
| 3 | 41444 D | Dowel bolt. | 4 | .250 |
| ... | Q 1925 | Lock washer, 5/8" | 4 | .013 |
| 4 | 41443 D | Pad, upper | 1 | 7.500 |
| 5 | 41440 D | Wearing pad. | 1 | 6.500 |
| ... | ..... | Cvsk. head rivet, 3/8 x 1-3/4" | 2 | .500 |
| 6 | 41458 DX | Center bolt and nut. | 1 | .089 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 1 | |
| 7 | 41457 D | No. 6 leaf. | 1 | |
| 8 | 41456 D | No. 5 leaf with clip | 1 | |
| 9 | 41455 D | No. 4 leaf | 1 | |
| 10 | 41454 D | No. 3 leaf | 1 | |
| 11 | 8941 DX | Bumper pad bracket with pad, L.H. | 1 | .709 |
| ... | Q 4150 | Cap screw, 7/8 x 3" N.C. | 4 | .05 |
| ... | Q 1929 | Lock washer, 7/8" | 4 | 2.000 |
| 12 | 58955 DA | Bumper pad | 2 | |
| 13 | 41453 D | No. 2 leaf | 1 | |
| 14 | 41452 D | No. 1 leaf | 1 | |
| 15 | 5777 D | Guide pad. | 1 | 4.500 |
| 16 | 5777 D | Guide pad. | 1 | 4.500 |
| 17 | 5775 DA | Saddle, lower. | 1 | 1.000 |
| 18 | 41445 D | Dowel bolt. | 2 | .05 |
| ... | Q 1929 | Lock washer, 7/8" | 2 | 85.500 |
| 19 | 5776 DA | Frame pad, lower | 1 | .879 |
| ... | Q 4154 | Cap screw, 7/8 x 4" N.C. | 3 | .921 |
| ... | Q 4155 | Cap screw, 7/8 x 4-1/4" N.C. | 3 | .05 |
| ... | Q 1929 | Lock washer, 7/8" | 6 | 1.000 |
| 20 | 41445 D | Dowel bolt. | 2 | .05 |
| ... | Q 1929 | Lock washer, 7/8" | 2 | .500 |
| 21 | 41442 D | Saddle bolt nut. | 16 | |
| 22 | 5773 DAX | Saddle with wearing pad, upper. | 1 | |

Note: If the tractor is equipped with a Rigid Track Frame, the parts listed above are not used.

SPARE PARTS CATALOG

TRACK FRAME DIAGONAL BRACE

Note. If the tractor is equipped with a Rigid Track Frame, the Track Frame Diagonal Brace is not used



A-1304

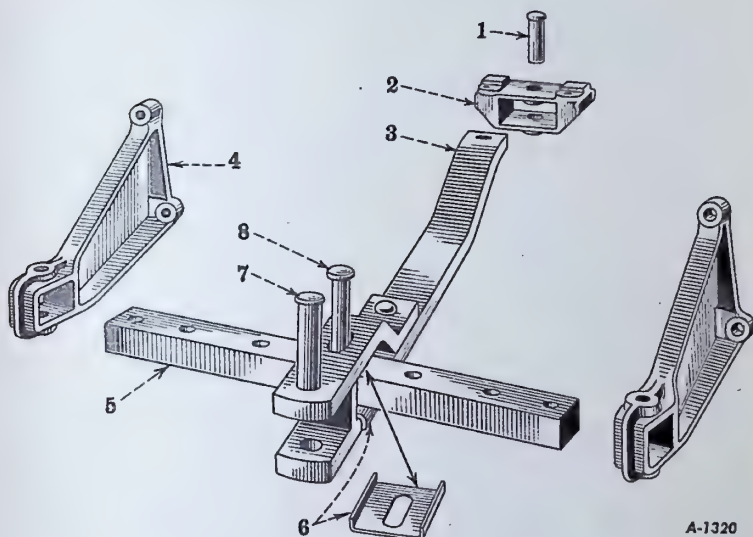
Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 1 | 5897 DA | Clamp. | 2 | 23.000 |
| ... | Q 1892 | Cap screw, 3/4 x 2-1/4" N.C. | 4 | .415 |
| ... | Q 4126 | Cap screw, 3/4 x 4-3/4" N.C. | 4 | .727 |
| ... | Q 1927 | Lock washer, 3/4" | 8 | .105 |
| 2 | ..... | Bolt, 1/2 x 4" N.F. | 4 | .187 |
| 3 | 18868 D | Lock washer, 1/2" (Shakeproof No. 1124) | 4 | .003 |
| 4 | ..... | Nut, 1/2" N.F. | 4 | .069 |
| 5 | 42134 D | Felt | 4 | .042 |
| 6 | 57241 D | Bushing (set of 4) | 2 | .468 |
| 7 | Q 3615 | Lubricator (Lincoln No. 5000) | 2 | .015 |
| 8 | 57237 DA | Bearing. | 2 | 18.75 |
| 9 | 42130 D | Shim, outer (extra heavy) | 2 | .104 |
| 10 | 42131 D | Shim, outer (heavy) | 2 | .083 |
| 11 | 42132 D | Shim, outer (medium) | 4 | .025 |
| 12 | 42127 D | Shim, inner (extra heavy) | 2 | .097 |
| 13 | 42128 D | Shim, inner (heavy) | 2 | .046 |
| 14 | 42129 D | Shim, inner (medium) | 4 | .031 |
| 15 | { 42005 DA | Brace, L.H. | 1 | 190.000 |
| | { 42006 DA | Brace, R.H. | 1 | 190.000 |
| 16 | 41842 D | Nut. | 12 | .281 |
| ... | Q 1929 | Lock washer, 7/8" | 12 | .05 |
| 17 | 63266 D | Stud | 12 | .500 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

DRAWBAR



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| 1 | 41589 D | Pivot pin. | 1 | 5.250 |
| 2 | 5831 DA | Bracket. | 1 | 43.000 |
| ... | Q 4186 | Cap screw, 1 x 3" N.C. | 4 | .969 |
| ... | ... | Lock washer, 1" | 4 | .088 |
| 3 | 41595 D | Drawbar. | 1 | 216.000 |
| ... | ... | Round head rivet, 1-1/4 x 5-1/2" | 2 | |
| 4 | 5830 DB | Guide bracket. | 2 | 38.000 |
| ... | ... | Lock washer, 1" | 6 | .088 |
| ... | ... | Hex. nut, 1" N.F. | 6 | .442 |
| 5 | 41591 DA | Guide. | 1 | 103.000 |
| ... | ... | Cap screw, 1-1/4 x 7" N.F. | 2 | |
| ... | ... | Hex. nut, 1-1/4" N.F. | 2 | .837 |
| ... | ... | Lock washer, 1-1/4" | 2 | .156 |
| 6 | 41592 D | Plate. | 2 | 2.625 |
| 7 | 41593 D | Clevis pin | 1 | |
| ... | ... | Cotter, 1/2 x 3" | 1 | |
| 8 | 41594 D | Stop pin | 1 | 3.500 |
| ... | ... | Cotter, 1/4 x 2-1/4" | 1 | .022 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

MEMORANDA

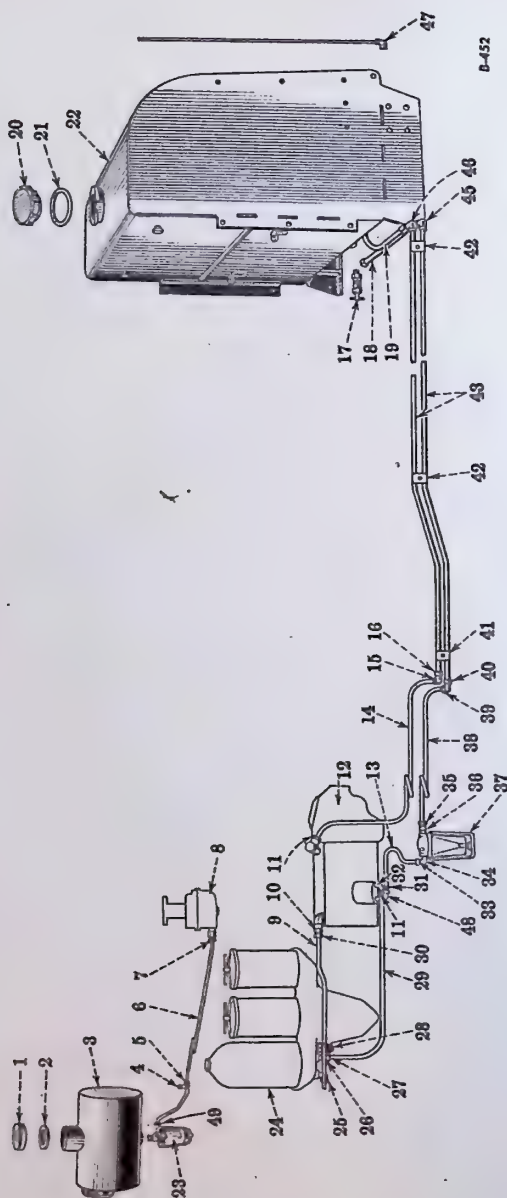
SPARE PARTS CATALOG

FUEL SYSTEM

| | Page No. |
|--|-------------|
| Carburetor | 4 to 6 |
| Fuel and gasoline tanks and piping | 2, 3 |
| Fuel injection pump | 10 to 12 |
| Fuel supply pump | 13 |
| Gasoline strainer assembly | 7 |
| Governor unit | 14 to 17 |
| Injection pump and connections | 8, 9 |
| Water trap | 7 |

SPARE PARTS CATALOG

FUEL AND GASOLINE TANKS AND PIPINGS



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

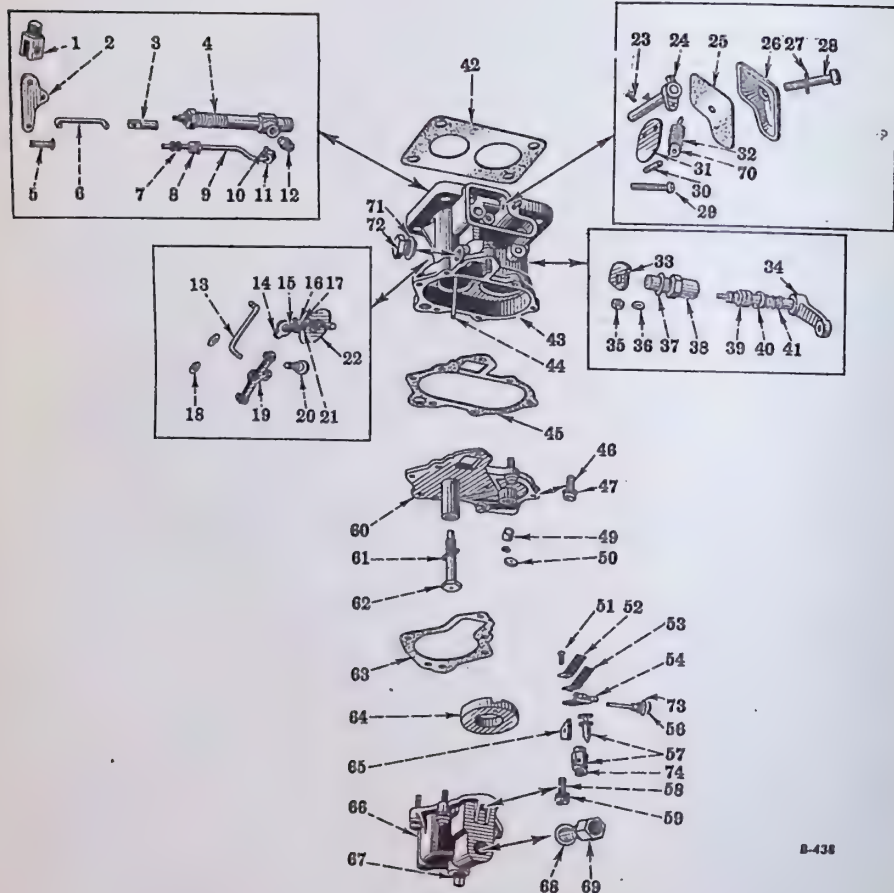
SPARE PARTS CATALOG

FUEL AND GASOLINE TANKS AND PIPINGS - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|---|----------|----------|
| 1 | 23995 DA | Cap | 1 | .250 | ... | ... | Standard pipe plug, 1/2" | 1 | |
| 2 | 23977 DA | Gasket | 1 | .015 | 23 | 51066 DBX | Gasoline strainer (Imperial Brass No. 4312) | 1 | .687 |
| 3 | 41574 DCX | Gasoline tank with cap | 1 | 6.250 | 24 | ... | Fuel filter | 1 | .111 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 4 | .045 | 25 | 37323 DX | Elbow with nut | 1 | |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 | 26 | 38026 DMX | Pipe connector with nut | 1 | .071 |
| 4 | 23125 D | Clip | 1 | .031 | 27 | 37165 D | Coupling nut | 1 | .031 |
| 5 | 16445 D | Felt | 1 | .000 | 28 | 9982 T | Drain cock | 1 | .062 |
| 6 | 60015 DX | Gasoline pipe with coupling nuts | 1 | .781 | 29 | 61405 DX | Fuel pipe | 1 | .250 |
| 7 | 29899 D | Coupling nut | 1 | .025 | 30 | 37165 D | Coupling nut | 2 | .031 |
| 8 | 42870 D | Carburetor | 1 | 5.500 | 31 | 37323 DX | Elbow with nut | 2 | .156 |
| 9 | 61406 DX | Fuel pipe with coupling nuts | 1 | .250 | 32 | 37165 D | Coupling nut | 1 | .031 |
| 10 | 37323 DX | Pipe elbow with nut | 1 | .111 | 33 | 37323 DX | Elbow with nut | 1 | .125 |
| 11 | 37165 D | Coupling nut | 2 | .031 | 34 | 37165 D | Coupling nut | 1 | .031 |
| 12 | 61299 D12 | Injection pump | 1 | 56.000 | 35 | 38026 DMX | Connector with nut | 1 | 2.375 |
| 13 | 61404 DX | Fuel pipe with coupling nuts | 1 | .187 | 36 | 60870 D | Water trap | 1 | |
| 14 | 54978 DX | Return pipe with coupling nuts | 1 | .312 | 37 | 56081 DX | Fuel pipe with coupling nuts | 1 | .375 |
| 15 | 37165 D | Coupling nut | 1 | .031 | 38 | 37165 D | Coupling nut | 1 | .031 |
| 16 | 42406 DX | Elbow with nut | 1 | .125 | 39 | 42406 DX | Elbow with nut | 1 | .125 |
| 17 | 48231 D | Valve | 1 | .375 | 40 | 42385 D | Clamp | 6 | .125 |
| 18 | 48438 D | Fuel pipe | 1 | .500 | 41 | ... | Cap screw, 3/8 x 1-1/2" N.F. | 3 | .068 |
| 19 | 28899 DB | Return pipe | 1 | .250 | 42 | Q 1805 | Hex. nut, 3/8" N.F. | 3 | .031 |
| 20 | 42387 D | Cap | 1 | .500 | ... | ... | Lock washer, 3/8" | 3 | .005 |
| 21 | 42495 D | Gasket | 1 | .025 | ... | ... | Fuel pipe | 2 | 1.000 |
| 22 | 42400 DEX | Fuel tank with cap | 1 | 220.000 | ... | ... | Elbow | 1 | .187 |
| ... | Q 1805 | Cap screw, 3/8 x 1-1/2" N.F. | 2 | .068 | 43 | 50148 D | Elbow | 1 | .187 |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 2 | .031 | 44 | 48232 D | Stand pipe | 1 | .250 |
| ... | Q 1850 | Cap screw, 1/2 x 1-1/4" N.C. | 2 | .120 | 45 | 48233 D | Elbow with nut | 1 | .125 |
| ... | Q 1846 | Cap screw, 1/2 x 3/4" N.C. | 6 | .092 | 46 | 48234 D | Elbow | 1 | .031 |
| ... | Q 1922 | Lock washer, 1/2" | 8 | .013 | 47 | 50607 DX | Gasoline pipe coupling nut | 1 | .025 |
| ... | ... | ... | ... | ... | 48 | ... | ... | ... | ... |
| ... | ... | ... | ... | ... | 49 | 29899 D | ... | ... | ... |

SPARE PARTS CATALOG

CARBURETOR



B-438

SPARE PARTS CATALOG

CARBURETOR - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|---|-------------|-------------|
| ... | 42870 D | Carburetor (as illust., less Ref. Nos. 1 to 6, 10 to 12 and 42) (Model C-12) (1-1/4") | 1 | 5.000 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 4 | .052 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| ... | ..... | Washer, 13/32 I.D. x 3/4" O.D. x 16 ga. | 4 | |
| 1 | 42775 D | Bell crank support | 1 | .093 |
| 2 | 42774 D | Bell crank | 1 | .250 |
| 3 | 42772 D | Rod end. | 1 | .125 |
| 4 | { 42771 D | Primer assembly (includes Ref. No. 12)... | 1 | .500 |
| | 67943 D | Primer (body only) | 1 | |
| 5 | 14611 H | Pin. | 1 | .013 |
| 6 | 42773 D | Cotter, 1/16 x 7/16" | 1 | |
| ... | ..... | Rod. | 1 | .125 |
| 7 | 32897 D | Cotter, 1/16 x 7/16" | 2 | |
| 8 | 32896 D | Tube packing | 2 | .000 |
| 9 | 32895 D | Tube gland | 1 | .020 |
| 10 | 32895 D | Inlet tube | 1 | .037 |
| 11 | 20684 D | Connector sleeve | 1 | .001 |
| 12 | 20683 D | Connector nut. | 1 | .078 |
| 13 | { 32948 D | Inlet valve. | 1 | |
| | 32948 DX | Inlet valve (includes Ref. Nos. 10, 11). | 1 | .012 |
| 14 | 42869 D | Connecting rod | 1 | .025 |
| 15 | ..... | Cotter, 1/16 x 1/2" (cad. plated). | 2 | |
| 16 | 42863 D | Shaft and lever. | 1 | .046 |
| 17 | 27452 D | Packing spring | 1 | .003 |
| 18 | 32590 D | Retainer | 1 | .001 |
| 19 | 14581 D | Packing. | 2 | .001 |
| 20 | 32592 D | Washer | 2 | .001 |
| 21 | 42867 D | Bell crank | 1 | .062 |
| 22 | 42868 D | Screw. | 1 | .015 |
| 23 | 31636 D | Butterfly screw. | 2 | .001 |
| 24 | 32589 DX | Shutter assembly | 1 | .031 |
| 25 | 14971 D | Butterfly screw. | 2 | .001 |
| 26 | 32602 DAX | Throttle shaft | 1 | .078 |
| 27 | 32607 DA | Gasket | 1 | .008 |
| 28 | 32608 D | Cover. | 1 | .062 |
| 29 | 32610 D | Screw gasket | 1 | .000 |
| 30 | 32609 D | Clamp screw. | 1 | .025 |
| 31 | 32600 D | Stop screw | 1 | .010 |
| 32 | 32599 D | Stop pin | 2 | .004 |
| 33 | 32601 D | Butterfly... | 1 | .025 |
| 34 | 27435 D | Spring | 1 | .012 |
| 35 | 32582 D | Cam. | 1 | .015 |
| 36 | 42871 D | Shaft and lever. | 1 | .125 |
| 37 | ..... | Type "B" hex. nut, No. 8 - 32 (cad. plated) | 1 | |
| 38 | ..... | Lock washer for No. 8 screw (cad. plated) | 1 | |
| 39 | 58836 D | Gasket | 1 | .003 |
| 40 | 32585 DA | Shaft bearing. | 1 | .046 |

(Continued on next page)

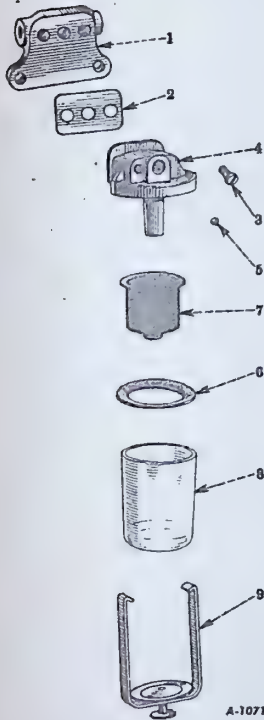
SPARE PARTS CATALOG

CARBURETOR - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|---|-------------|-------------|
| 39 | 32588 D | Dust washer. | 2 | .031 |
| 40 | 32587 D | Retainer | 1 | .001 |
| 41 | 32586 D | Spring | 1 | .002 |
| 42 | 42769 D | Gasket | 1 | .010 |
| 43 | 5049 DAX32 | Body with bushings and plugs | 1 | 2.562 |
| 44 | 32614 DX | Tube | 1 | .006 |
| 45 | 32597 D | Gasket | 1 | .012 |
| 46 | ..... | Lock washer for No. 12 screw (cad. plated) | 3 | |
| 47 | ..... | Screw, No. 12 - 24 x 3/4" (cad. plated) | 3 | |
| 49 | 27445 DB | Drip hole filler | 1 | .001 |
| 50 | 57957 D | Plug | 1 | .002 |
| 51 | ..... | Screw, No. 4 - 36 x 7/16" (cad. plated) | 1 | |
| 52 | 32578 D | Spring, upper leaf | 1 | .002 |
| 53 | 32577 D | Spring, lower leaf | 1 | .001 |
| 54 | 32575 D | Float lever. | 1 | .015 |
| 56 | 32576 DX | Float pivot screw. | 1 | .010 |
| 57 | 32581 DXA | Valve cage assembly. | 1 | .031 |
| 58 | {..... | Screw, No. 12-24 x 3/4" (cadmium plated) | 1 | |
| 59 | {..... | Screw, No. 12-24 x 1" (cadmium plated) | 4 | |
| 59 | ..... | Lock washer for No. 12 screw (cad. plated) | 5 | |
| 60 | 5975 DX | Bottom plate (includes Ref. Nos. 49 and 50) | 1 | .718 |
| 61 | 32615 D | Gasket | 1 | .000 |
| 62 | 32616 D | Metering well. | 1 | .025 |
| 63 | 32606 DA | Gasket | 1 | .007 |
| 64 | 32572 DAX | Float with ferrule | 1 | .031 |
| 65 | 32574 D | Plate. | 1 | .005 |
| 66 | { 5051 DX | Fuel bowl with float lever spacer. | 1 | .750 |
| 66 | { 35691 DX | Bowl, complete with adapter (includes Ref. Nos. 52 to 57, 64, 65, 68, 69, and 74) | 1 | .968 |
| 67 | ..... | Steel pipe plug, 1/8" (cad. plated). | 1 | |
| 68 | 18377 D | Strainer screen gasket | 1 | .003 |
| 69 | 29902 DX | Screen retainer. | 1 | .046 |
| 70 | 27436 D | Spring end | 1 | .004 |
| 71 | 18377 D | Plug gasket. | 1 | .003 |
| 72 | 42844 D | Plug | 1 | .031 |
| 73 | 25948 D | Float lever pivot screw gasket | 1 | .000 |
| 74 | 25948 D | Needle valve cage gasket | 1 | .000 |
| ... | 25969 DA | Starting shutter shaft, short. | 1 | 3.500 |
| ... | 32604 D | Float lever spacer | 1 | |
| ... | 53079 D | Float and lever assembly | 1 | .041 |
| ... | 58836 D | Locking shaft bearing gasket | 1 | |

SPARE PARTS CATALOG

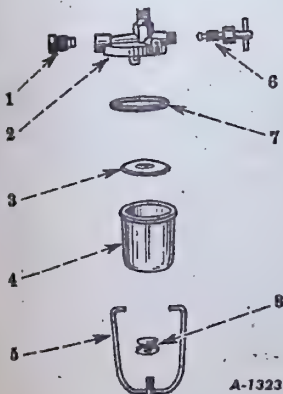
WATER TRAP



When ordering, always use I H C Part Nos.

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| ... | 60870 D | Water trap (Includes Ref. Nos. 2 thru 9) | 1 | 2.437 |
| ... | Q 1864 | Cap screw, 1/2"x 3" N.C. | 1 | .217 |
| ... | Q 1922 | Lock washer, 1/2". | 1 | .013 |
| 1 | 8221 DA | Bracket. | 1 | .875 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 2 | .052 |
| ... | Q 1920 | Lock washer, 3/8". | 2 | .005 |
| 2 | 51527 D | Gasket | 1 | .007 |
| 3 | 60871 D | Vent screw | 1 | .021 |
| 4 | 9118 DX | Water trap top | 1 | 1.187 |
| 5 | 24805 D | Water trap top plug. | 1 | .001 |
| 6 | 68070 D | Water trap gasket. | 1 | .005 |
| 7 | 60872 D | Water trap screen. | 1 | .125 |
| 8 | 60877 D | Water trap glass | 1 | .718 |
| 9 | 60878 DX | Water trap bail. | 1 | .125 |

GASOLINE STRAINER ASSEMBLY

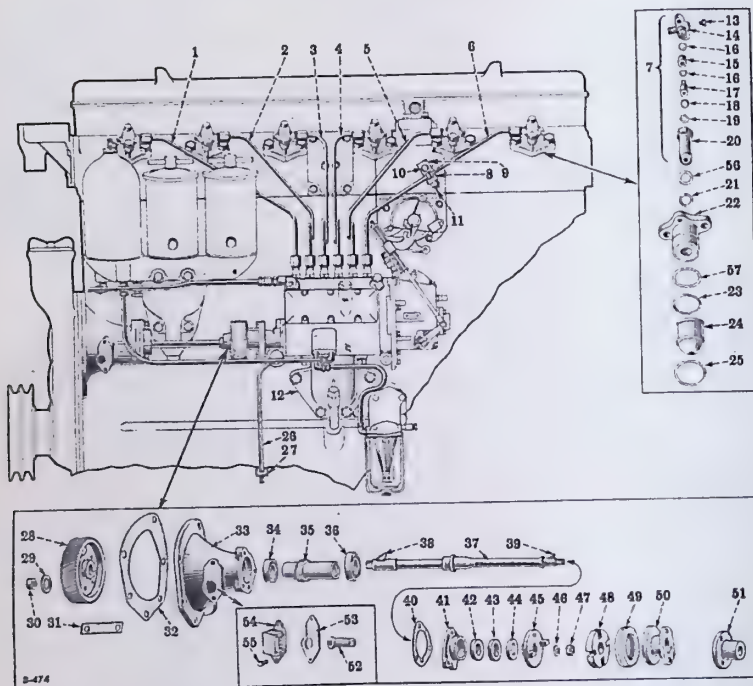


| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--------------------------------------|----------|----------|
| ... | 51066 DBX | Gasoline strainer, complete. | 1 | .687 |
| 1 | 29899 D | Coupling nut | 1 | .025 |
| 2 | 54486 D | Top or body. | 1 | .250 |
| 3 | 13194 D | Screen | 1 | .006 |
| 4 | 51344 V | Glass. | 1 | .312 |
| 5 | 17564 D | Ball or strap. | 1 | .062 |
| 6 | 52855 D | Valve. | 1 | .020 |
| 7 | 68367 D | Gasket | 1 | .001 |
| 8 | 17565 DA | Nut and cap. | 1 | .031 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

INJECTION PUMP AND CONNECTIONS



| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| ... | 61299 D12 | Injection pump (includes pump unit, governor and fuel supply pump) (see detail lists) (pages 8 to 15) | 1 | 55.000 |
| ... | Q 4017 | Cap screw, 3/8 x 7/8" N.C. | 4 | .048 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| ... | 54910 D | Set of six (6) injection pipes | 1 | 2.437 |
| 1 | 54911 DX | Pipe (No. 1) | 1 | .406 |
| 2 | 54912 DX | Pipe (No. 2) | 1 | .375 |
| 3 | 54913 DX | Pipe (No. 3) | 1 | .375 |
| 4 | 54914 DX | Pipe (No. 4) | 1 | .375 |
| 5 | 54915 DX | Pipe (No. 5) | 1 | .406 |
| 6 | 54916 DX | Pipe (No. 6) | 1 | .406 |
| 7 | 52613 D | Nozzle (Ref. No. 13 thru 20) | 6 | 1.375 |
| 8 | 27927 DA | Washer | 2 | .062 |
| 9 | 42799 D | Clip, front. | 1 | .125 |
| ... | 56617 D | Clip, rear | 1 | .093 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 2 | .045 |
| ... | Q 1920 | Lock washer, 3/8" | 2 | .005 |
| 10 | ..... | Washer, 5/16" | 2 | .015 |
| 11 | ..... | Nut, 5/16" | 2 | .015 |
| 12 | 5986 D | Bracket | 1 | 3.750 |
| ... | Q 1852 | Cap screw, 1/2 x 1-1/2" N.C. | 4 | .134 |
| ... | Q 1912 | Lock washer, 1/2" | 4 | .013 |

SPARE PARTS CATALOG

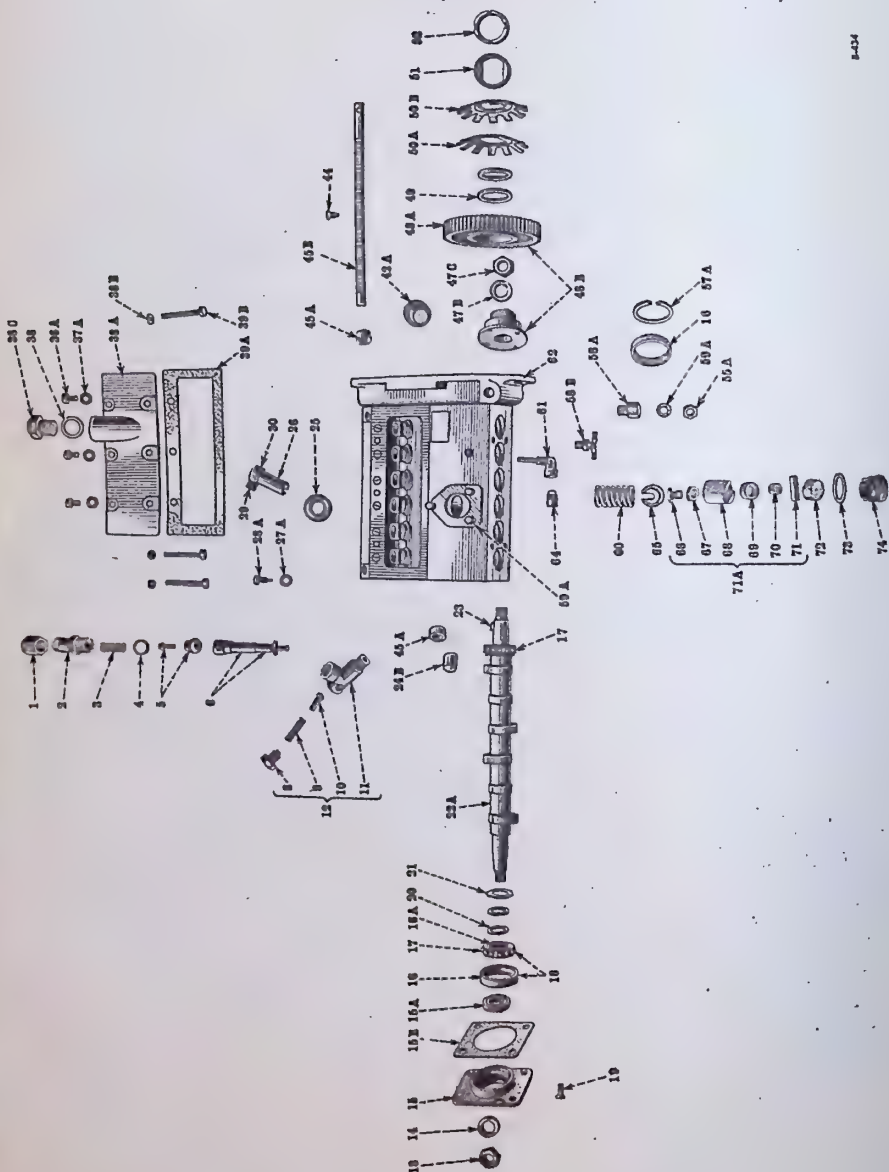
INJECTION PUMP AND CONNECTIONS - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| 13 | 32493 D | Bleeder valve. | 6 | .031 |
| 14 | 52612 D | Nozzle fitting. | 6 | .593 |
| ... | Q 1809 | Cap screw, 3/8 x 2" N.F. | 12 | .084 |
| 15 | 37150 D | Spacer. | 6 | .046 |
| 16 | 37148 D | Gasket. | 12 | .062 |
| 17 | 37152 D | Valve and spring assembly. | 6 | .140 |
| 18 | 43192 DA | Plate. | 6 | .218 |
| 19 | 37148 D | Gasket. | 6 | .062 |
| 20 | 42766 D | Nozzle body. | 6 | .468 |
| 21 | 42767 D | Nozzle body gasket. | 6 | .007 |
| 22 | 42765 DA | Nozzle body retainer. | 6 | 2.187 |
| 23 | 43002 D | Spacer gasket. | 6 | .062 |
| 24 | 56291 D | Spacer. | 6 | .515 |
| 25 | 43002 D | Spacer gasket. | 6 | .023 |
| 26 | 61407 DX | Injection pump overflow pipe with coupling nuts. | 1 | |
| 27 | 52128 D | Injection pump overflow pipe clip. | 1 | .020 |
| ... | ... | Washer, 13/32 I.D. x 3/4" O.D. x 16 ga. | 1 | |
| 28 | 25362 D | Gear (54 teeth). | 1 | 4.750 |
| 29 | 25354 D | Nut lock. | 1 | .062 |
| 30 | ... | Nut, 3/4". | 1 | .201 |
| 31 | 32341 D | Lock. | 1 | .062 |
| 32 | 32340 D | Housing gasket. | 1 | .031 |
| 33 | 5005 DAX | Housing with plug. | 1 | 10.187 |
| ... | ... | Cap screw, 1/2 x 1-7/8" N.F. | 2 | .162 |
| ... | Q 1848 | Cap screw, 1/2 x 1" N.C. | 2 | .106 |
| ... | Q 4053 | Cap screw, 1/2 x 3-3/4" N.F. | 1 | .259 |
| ... | Q 1854 | Cap screw, 1/2 x 1-3/4" N.C. | 1 | .148 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 3 | .069 |
| ... | Q 1922 | Lock washer, 1/2". | 4 | .013 |
| 34 | [10701 DA | Bearing (New Departure No. 7505) (optional) | 1 | .281 |
| | [ST 213 | Bearing (IHC) (optional). | 1 | |
| 35 | 49453 DX | Hour meter drive gear. | 1 | 1.250 |
| 36 | [23674 D | Bearing (New Departure No. 3206) (optional) | 1 | .457 |
| | [ST 208 | Bearing (IHC) (optional). | 1 | |
| 37 | 32345 D | Shaft. | 1 | 2.500 |
| ... | ... | Cotter, 3/32 x 7/8". | 1 | .002 |
| 38 | 4710 D | Key (Woodruff No. 15). | 1 | .062 |
| 39 | 7220 T | Key (Woodruff No. 9). | 1 | .007 |
| 40 | 32342 D | Gasket. | 1 | .006 |
| 41 | 5006 DAX | Cap with felt and felt retainer. | 1 | .937 |
| ... | Q 1804 | Cap screw, 3/8 x 1-1/4" N.C. | 1 | .060 |
| ... | Q 1920 | Lock washer, 3/8". | 3 | .005 |
| 42 | 12480 L | Oil seal. | 1 | .085 |
| 43 | 32362 D | Felt. | 1 | .008 |
| 44 | 32343 D | Felt retainer. | 1 | .031 |
| 45 | [32346 DAX | Flange with pin. | 1 | 1.125 |
| | [G 3836 | Dowel pin. | 1 | .002 |
| 46 | 32347 D | Washer. | 1 | .062 |
| 47 | Q 1909 | Nut, 1/2" N.F. | 1 | .069 |
| 48 | 31439 DB | Spacer. | 1 | .250 |
| 49 | 31441 D | Boot. | 1 | .250 |
| 50 | 33275 D | Adjuster. | 1 | 1.750 |
| ... | Q 4020 | Cap screw, 3/8 x 5/8" N.F. | 2 | .045 |
| ... | Q 1920 | Lock washer, 3/8". | 2 | .005 |
| 51 | 54909 D | Drive flange. | 1 | 1.125 |
| 52 | 49454 D | Hour meter driven gear assembly. | 1 | .500 |
| 53 | 49451 D | Hour meter gasket. | 1 | .250 |
| 54 | 49450 D | Hour meter. | 1 | 1.125 |
| ... | Q 1913 | Lock washer, 1/4". | 2 | .002 |
| 55 | 23086 D | Hour meter cap screw. | 2 | .062 |
| 56 | 61208 D | Nozzle body dust seal. | 6 | .007 |
| 57 | 61209 D | Nozzle body retainer dust seal. | 6 | .005 |
| ... | 29898 D | Injection pump overflow pipe nut. | 1 | .015 |
| ... | 64121 D | Injection pump overflow pipe clip, upper | 1 | .015 |

SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

PUMP UNIT



SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

PUMP UNIT - Continued

| Ref. No. | I H C Part No. | Bosch Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|----------------|---|-----------|----------|
| ... | 61910 D | ..... | Pump unit, complete (less Ref. Nos. 8 thru 12 and 47C thru 55). | 1 | |
| 1 | 40255 D | WMU 9A 2X | Delivery valve holder protection cap. | 6 | .062 |
| 2 | 54320 D | HP 7624 | Delivery valve holder | 6 | .062 |
| 3 | 54329 D | SP 7617 | Delivery valve spring | 6 | .010 |
| 4 | 55361 D | WNR 2021/3X | Delivery valve holder gasket. | 6 | .001 |
| 5 | 54326 D | VA 7636A | Delivery valve and seat | 6 | .093 |
| 6 | 54337 D | BC7641-2A | Plunger and barrel | 6 | .130 |
| 8 | 54374 D | SC 7630 | Valve screw | 1 | .031 |
| 9 | 40401 D | WSF 2177/1X | Valve spring | 1 | .003 |
| 10 | 40399 DA | PVE 48A/1X | Overflow valve | 1 | .000 |
| 11 | 54373 DB | VA 7923 | Valve body | 1 | .202 |
| 12 | 54372 DB | VA 7613A | Overflow valve, complete. | 1 | .280 |
| 13 | 54290 D | WMU 511/2X | Camshaft hexagon nut. | 1 | .031 |
| 14 | Q 1922 | WA5-1/6CA | Lock washer, 1/2" | 1 | .013 |
| 15 | 56112 DX | PI 7629A | End plate with oil seal | 1 | .240 |
| 15A | 54295 D | PK 764 | End plate oil seal. | 1 | .015 |
| 15B | 64998 D | GA 76135 | End plate gasket. | 1 | .001 |
| 16 | 64960 D | NIR 6/17X | Camshaft bearing outer race | 1 | |
| 16A | 64959 D | NAR 6/17X | Camshaft bearing inner race | 2 | |
| 17 | 64361 D | NFR 6/17Z | Camshaft bearing retainer and balls | 2 | |
| 18 | 54293 D | NKL 6/17Z | Camshaft bearing (ND 17H) | 2 | |
| 19 | 40216 D | MSR 734/19X | End plate fastening screw | 2 | |
| | 54296 D | WMS 101/11X | Bearing adjusting washer (0.10 m.m.) | 4 | .125 |
| 20 | 54297 D | WMS 101/27X | Bearing adjusting washer (0.13 m.m.) | As Req'd. | .008 |
| | 54298 D | WMS 101/25X | Bearing adjusting washer (0.30 m.m.) | As | .000 |
| 21 | 56113 D | WMS 2215/1X | Camshaft oil thrower | 1 | .000 |
| 22A | 56111 D | PAC 59/2X | Camshaft (fast profile No. 2) | 1 | .003 |
| 22 | 54291 D | NKE 5/1X | Camshaft key (Woodruff) | 1 | 2.000 |
| 23 | 61965 D | CV 76108 | Control rod protection cover. | 1 | .005 |
| 24B | 54334 D | PMS 7/2X | Plunger spring seat, upper. | 1 | .012 |
| 25 | 54334 D | PMS 3/2X | Control sleeve. | 6 | .015 |
| 26 | 54230 D | GA 7615 | Barrel set screw gasket | 6 | .093 |
| 27A | 62123 D | GA 7615 | Barrel set screw | 6 | .007 |
| 28A | 61969 D | WSR 2100/2X | Toothed segment clamping screw. | 6 | .003 |
| 29 | 54332 D | PZR 44/1X | Toothed segment | 6 | .015 |
| 30 | 54331 D | SC 1119-1 | Inspection cover fastening screw, short | 3 | .003 |
| 36A | 62130 D | WA22-8CA | Inspection cover fastening screw, short, lock washer. | 3 | |
| 37A | 52745 V | WA22-8CA | Oil filler plug gasket. | 1 | .002 |
| 38 | 62111 D | CV 2041/2X | Inspection cover. | 1 | |
| 38A | 62116 D | WR 76117 | Inspection cover fastening screw, long, gasket. | 1 | .002 |
| 38B | 67870 D | GA 7616 | Inspection cover fastening screw, long, gasket. | 3 | |

(Continued on next page)

SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

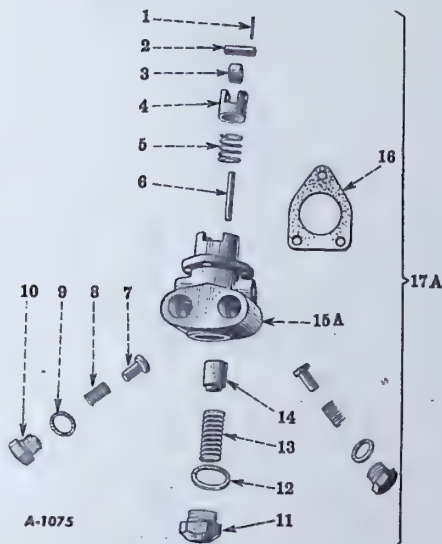
PUMP UNIT - Continued

| Ref. No. | I H C Part No. | Bosch Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|----------------|--|-----------|----------|
| 38C | 62117 D | PG 7621 | Oil filler plug. | 1 | .062 |
| 39A | 62119 D | GA 76117 | Inspection cover gasket. | 1 | .004 |
| 39B | 62121 D | SC 7661 | Inspection cover fastening screw, long | 3 | .031 |
| 42A | 61959 DX | BA 791 | Pump housing baffle with button. | 1 | .015 |
| 44A | 54306 D | WSR 2125/LX | Control rod securing screw | 1 | .015 |
| 45A | 54299 D | BG 763 | Control rod bushing. | 2 | .015 |
| 45B | 61964 D | RD 7693 | Control rod. | 1 | .375 |
| 47B | Q 1922 | WA5-16CA | Lock washer, 1/2". | 1 | .013 |
| 47C | 62199 D | NT 7921 | Drive gear hub nut | 1 | .062 |
| 48A | 62195 D | GE 7919 | Drive gear | 1 | .562 |
| 48B | 62192 D | GE 7918A | Drive gear assembly. | 1 | 1.000 |
| 49 | 54411 D | SR 794/1 | Adjusting spacer { .035 } | As Req'd. | .010 |
| | 54412 D | SR 794/2 | Adjusting spacer { .049 } | | .015 |
| | 54413 D | SR 794/3 | Adjusting spacer { .065 } | | .015 |
| | 62622 D | SR 794/4 | Adjusting spacer { .020 } | | .003 |
| 50A | 62196 D | DC 792 | Drive gear spring disc, inner. | 1 | .031 |
| 50B | 62197 D | DC 795 | Drive gear spring disc, outer. | 1 | .031 |
| 51 | 62198 D | WA 7918 | Drive gear adjusting nut lock washer | 1 | .007 |
| 52 | 54416 D | NT 795 | Drive gear adjusting nut | 1 | .031 |
| 55A | Q 1902 | NT5 8CA | Hexagon nut, 1/4" N.C. | 3 | .007 |
| 56A | 52745 V | WA22 8CA | Fuel supply pump lock washer (Shakeproof No. 1214) | 3 | .008 |
| 57A | 61917 D | RG 767 | Bearing retainer ring. | 1 | .062 |
| 58A | 61958 D | PG 7617 | Lubricating oil drain plug | 1 | .008 |
| 58B | 59708 D | FI 765 | Lubricating oil level cock | 1 | .007 |
| 59A | 61956 D | SD 7610 | Fuel supply pump stud. | 1 | .031 |
| 60 | 54323 DA | WSF2205A 400X | Plunger spring | 6 | .007 |
| 61 | 56121 D | FI 7613A | Lubricating oil overflow connection. | 1 | .062 |
| 62 | 61919 DX | EG 76204A | Pump housing | 1 | 17.500 |
| 64 | 29898 D | ..... | Pipe plug, 3/8". | 2 | .015 |
| | 54335 D | PMS 6/LX | Lubricating oil overflow elbow nut | 1 | .007 |
| 65 | 54335 D | PSR 3/LX | Plunger spring seat, lower | 6 | .015 |
| 66 | 54346 D | WTU 2066/EX | Tappet screw | 6 | .007 |
| 67 | 54347 D | PKB 41/LX | Tappet screw lock nut. | 6 | .125 |
| 68 | 54349 DBX | PRL 1/3X | Tappet shell with insert | 6 | .020 |
| 69 | 54351 D | PMB 4/LX | Tappet roller. | 6 | .010 |
| 70 | 54350 D | PBO 1/LX | Tappet roller bushing. | 6 | .125 |
| 71 | 54349 D | PKB 41/L2 | Tappet pin | 6 | .010 |
| 71A | 54345 DA | PPT 22/EX | Tappet, complete | 6 | .002 |
| 72 | 54431 D | WM2041/405X | Felt cushion | 6 | .002 |
| 74 | 61970 D | PG 7614 | Closing plug gasket. | 6 | .002 |
| 75 | 62124 D | ..... | Closing plug | 6 | .093 |
| ... | 40329 DA | SC 150-8CA | Name plate drive rivet | 2 | .005 |

SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

FUEL SUPPLY PUMP



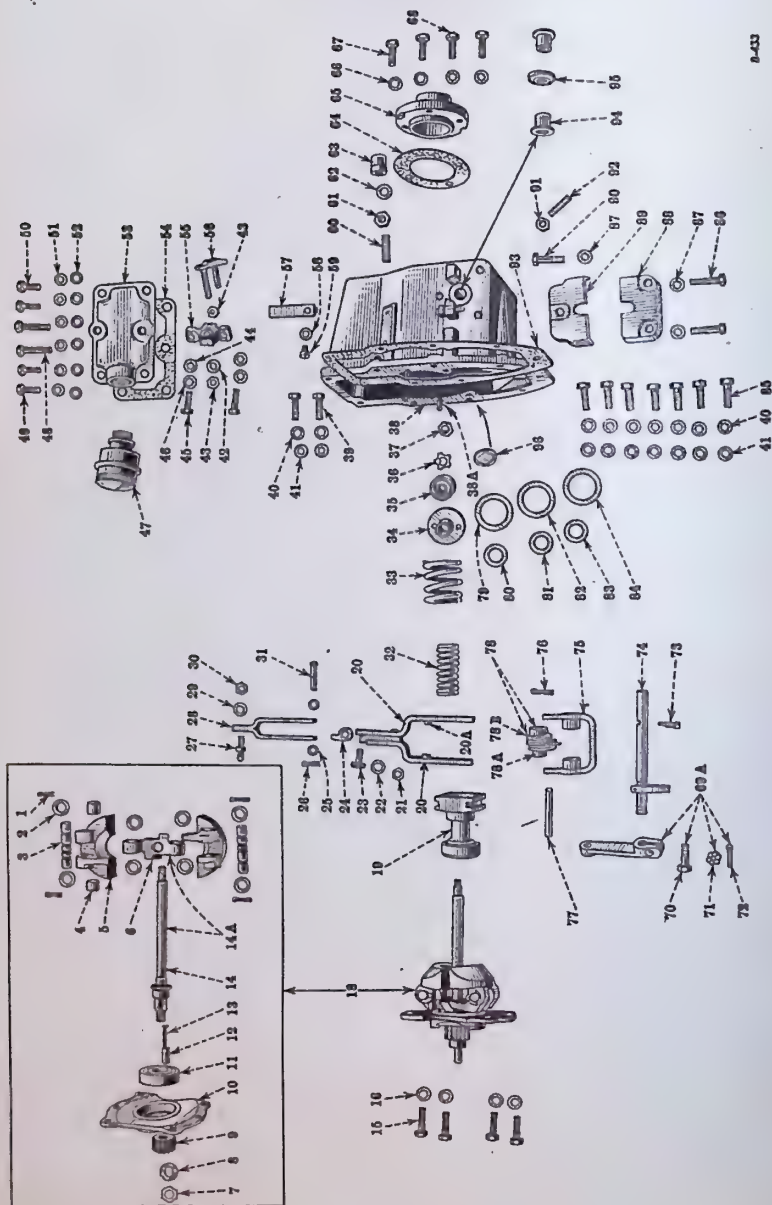
A-1075

| Ref. No. | I H C Part No. | Bosch Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|----------------|--|----------|----------|
| 1 | 43189 D | PN 797 | Tappet securing pin | 1 | .001 |
| 2 | 40388 D | WBO2174/1X | Tappet wrist pin. | 1 | .021 |
| 3 | 40390 D | WRL2004/1X | Tappet roller | 1 | .062 |
| 4 | 40386 D | PVE46/1X | Tappet shell. | 1 | .062 |
| 5 | 40395 D | WSF2197A1X | Tappet spring | 1 | .006 |
| 6 | ..... | ..... | Spindle (order 62126 DY). | 1 | .004 |
| 7 | 40385 D | PVE45/1X | Inlet or outlet valve | 2 | |
| 8 | 54371 D | WSF2196/4X | Valve spring. | 2 | .006 |
| 9 | 62129 D | WMR2041/404X | Valve spring retainer screw gasket | 2 | |
| 10 | 40397 D | WVU2097/1X | Valve spring retainer screw | 2 | .077 |
| 11 | 54367 D | SC7919A | Plunger spring retainer screw with plug. | 1 | .082 |
| 12 | 61111 D | WMR2041/2X | Plunger spring retainer screw gasket | 1 | |
| 13 | 54366 D | WSF2216A/1X | Plunger spring. | 1 | .015 |
| 14 | ..... | ..... | Plunger (order 62126 DY). | 1 | |
| 15A | 62126 DY | ..... | Fuel supply pump housing with plunger and spindle. | 1 | .812 |
| 16 | 54364 DB | GA 76120 | Fuel supply pump housing gasket | 1 | |
| 17A | 62125 D | AFP/K16NK522 | Fuel supply pump, complete. | 1 | 2.250 |

SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

GOVERNOR UNIT



SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

GOVERNOR UNIT - Continued

| Ref. No. | I H C Part No. | E83CH Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|----------------|--|----------|----------|
| .. | 62192 D | 8VA233/800P264 | Governor, complete. | 1 | .. |
| 1 | 62220 D | PN2-20CA | Cotter pin, 1/16 x 5/8" | 4 | .000 |
| 2 | 62219 D | WA 1134 | Governor weight washer. | 8 | .002 |
| 3 | 62218 D | PN 7950 | Governor weight pin. | 2 | .052 |
| 4 | 62217 D | EG 7918 | Governor weight bushing. | 4 | .015 |
| 5 | 62216 D | WT 7926 A | Governor weight (pair). | 1 | 1.125 |
| 6 | 62215 D | WT 7926 A | Governor spider (order 62214 D) | 1 | .008 |
| 7 | 62214 D | NT 7923 | Governor driven gear nut. | 1 | .001 |
| 8 | 62213 D | WA 7919 | Governor driven gear lock washer. | 1 | .062 |
| 9 | 62212 D | GE 7920 | Governor driven gear. | 1 | .006 |
| 10 | 62211 D | PL 7940 | Bearing support plate with dowels | 1 | .187 |
| 11 | 62210 D | BB 7911 | Governor weight shaft bearing (drive end) (ND-3203-B) | 1 | .004 |
| 12 | 62209 D | PC 799 | Governor shaft plunger oiler. | 1 | .002 |
| 13 | 62208 D | SP 7954 | Governor shaft plunger oiler spring. | 1 | .392 |
| 14 | 62207 D | SH 7928 A | Governor weight shaft (order 62214 D) | 1 | .018 |
| 14A | 62206 D | SC 1110-1 | Bearing support plate bolt. | 4 | 2.312 |
| 15 | 62205 D | WA22-8CA | Bearing support plate lock washer. | 1 | .500 |
| 16 | 62204 D | SH 7924 A | Governor shaft with spider and weights (less Ref. | 1 | .015 |
| 17 | 62203 D | SV 7910 A | Sleeve with bushing and bearing. | 1 | .281 |
| 18 | 62202 D | LE 7946 A | Fulcrum lever with link and bracket, (also includes Ref. Nos. 20, 25 thru 31, 75, 76 and 77) | 1 | .031 |
| 19 | 62201 D | LE 7950 | Fulcrum lever pivot pin. | 1 | .020 |
| 20 | 62200 D | PN 7931 | Hexagon nut, 1/4" N.F. | 1 | .007 |
| 20A | 62199 D | WA 22-8CA | Smoke limit cam screw lock washer. | 1 | .001 |
| 21 | 62198 D | SC 1136 | Smoke limit cam. | 1 | .020 |
| 22 | 62197 D | CA 793 | Control rod link pin washer. | 1 | .125 |
| 23 | 62196 D | CA 1156 | Cotter pin, 1/16 x 7/16". | 1 | .031 |
| 24 | 62195 D | PN 7935 | Control rod linkage pin. | 1 | .020 |
| 25 | 62194 D | LK 796 | Control rod link. | 1 | .093 |
| 26 | 62193 D | WA 22-8CA | Control rod linkage pin lock washer. | 1 | .062 |
| 27 | 62192 D | NT 8-8CA | Hexagon nut, 1/4" N.F. | 1 | .046 |
| 28 | 62191 D | PN 7946 | Control rod link pin. | 1 | .. |
| 29 | 62190 D | SP 7950/16 | Governor spring, inner. | 1 | .. |
| 30 | 62189 D | SP 7951/10 | Governor spring, outer. | 1 | .. |
| 31 | 62188 D | GU 7912 | Spring seat. | 1 | .. |
| 32 | 62187 D | BB 7912 | Governor weight shaft bearing (spring end) (ND 87008) | 1 | .. |

(Continued on next page)

SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

GOVERNOR UNIT - Continued

| Ref. No. | I H C Part No. | Bosch Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|-------------------|--|-------------|-------------|
| 36 | 62626 D | WA 1182 | Governor weight shaft bearing lock washer (spring end) | 1 | .001 |
| 37 | 62627 D | NT 1070 | Governor weight shaft bearing nut (spring end) | 1 | .005 |
| 38 | 62201 D | CV 7984A | Governor end cover | 1 | 2.500 |
| 38A | 62207 D | PN 751 | Bearing support plate dowel | 2 | .015 |
| 39 | 62204 D | SC 1110 | Governor end cover bolt (drilled) | 2 | .000 |
| 40 | 52745 V | WA 22-8CA | Governor end cover bolt lock washer | 9 | .001 |
| 41 | 62206 D | WA 1143 | Governor end cover bolt washer | 9 | .006 |
| 42 | 55428 DA | WA 1155 | Stop plate screw washer | 2 | .031 |
| 43 | ..... | NT8-8CA | Hexagon jam nut, 1/4" N.F. | 2 | .001 |
| 44 | 62206 D | WA 1143 | Stop plate bridge lock washer | 2 | .017 |
| 45 | 62205 D | SC 1110-1 | Stop plate bridge bolt | 2 | .000 |
| 46 | 52745 V | WA 22-8CA | Stop plate bridge lock washer | 2 | .312 |
| 47 | 60740 D | CV 76126A | Breather, complete | 1 | .015 |
| 48 | 62275 D | SC 1139 | Governor inspection cover bolt, center | 2 | .025 |
| 49 | 62276 D | SC 1140-1 | Governor inspection cover bolt, drilled | 2 | .014 |
| 50 | 62633 D | SC 1140 | Governor inspection cover bolt, short | 2 | .015 |
| 51 | 52745 V | WA22-8CA | Governor inspection cover bolt lock washer | 6 | .001 |
| 52 | 62206 D | WA 1143 | Governor inspection cover bolt washer | 6 | .001 |
| 53 | 62273 D | CV 7983 | Governor inspection cover | 1 | .001 |
| 54 | 62274 D | GA 7979 | Governor inspection cover gasket | 1 | .006 |
| 55 | 62267 D | BK 7917 | Stop plate bridge | 1 | .093 |
| 56 | 64174 D | PL 7961A | Stop plate bridge with stop plate | 1 | .108 |
| 57 | 64175 D | PL 7959A | Stop plate with washer and nut | 1 | .093 |
| 58 | 62208 D | SP 7953 | Bumper spring | 1 | .003 |
| 59 | ..... | WA22-6CA | Bumper spring lock washer | 1 | .001 |
| 60 | 62209 D | SC25/5CA | Fillister head screw, No. 12-24 N.C. x 5/16" | 1 | .004 |
| 61 | Q 1903 | NT6-10CA | Bumper spring adjusting screw | 1 | .017 |
| 62 | 62211 D | GA 7980 | Hex. nut, 5/16" N.F. | 1 | .031 |
| 63 | 62210 D | GA 7917 | Bumper spring cap gasket | 1 | .001 |
| 64 | 62235 D | GA 7982 | Bumper spring cap | 1 | .031 |
| 65 | 62233 D | CP 7910 | Spring retainer end cap gasket | 1 | .500 |
| 66 | 40753 D | WA22-8CA | Spring retainer end cap | 1 | .015 |
| 67 | 62204 D | SC 1110 | Spring retainer end cap lock washer | 2 | .008 |
| 68 | 62205 D | SC 1110-1 | Spring retainer end cap bolt, upper (drilled) | 2 | .125 |
| 69A | 62263 DX | LE 7957A | Spring retainer end cap bolt, lower | 1 | .017 |
| 70 | 62264 D | SC 7961 | Operating lever with bolt and nut | 1 | .017 |
| 71 | 62265 D | NT 7919 | Operating lever bolt | 1 | .004 |

SPARE PARTS CATALOG

DETAIL PARTS OF FUEL INJECTION PUMP - Continued

GOVERNOR UNIT - Continued

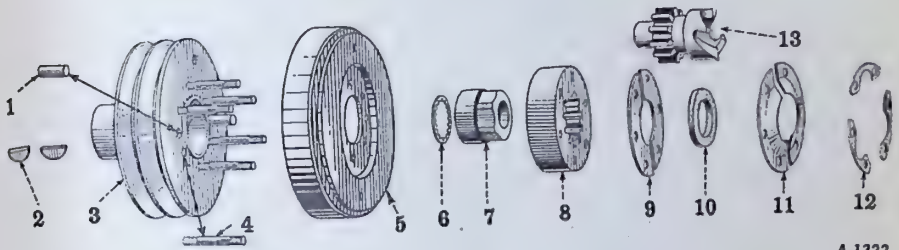
| | | | | |
|-----|------------|---|----------|------|
| 72 | PN2-289EA | Cotter pin, 1/16 x 5/8" | 1 | .003 |
| 73 | SC 7930 | Spring plate set screw | 1 | .233 |
| 74 | SH 7930A | Operating lever shaft | 1 | .125 |
| 75 | BK 7913A | Fulcrum lever bracket and bearings | 1 | |
| 76 | PN2-20CA | Cotter pin, 1/16 x 5/8" | 1 | .004 |
| 77 | PN 7951 | Fulcrum lever bracket pin | 1 | .093 |
| 78 | PL 7925A | Operating shaft plate with spring | 1 | .062 |
| 78A | PL 7923A | Operating shaft plate (less spring) | 1 | .031 |
| 78B | SP 7949 | Operating shaft plate spring | 1 | .004 |
| 79 | SR 7914/1 | Outer spring spacer (.020) | As req'd | .004 |
| 80 | SR 799/1 | Inner spring spacer (.020) | As req'd | .004 |
| 81 | SR 799/2 | Inner spring spacer (.042) | As req'd | .007 |
| 82 | SR 7914/2 | Outer spring spacer (.042) | As req'd | .007 |
| 83 | SR 799/3 | Inner spring spacer (.058) | As req'd | .010 |
| | SR 799/4 | Inner spring spacer (.083) | As req'd | .020 |
| 84 | SR 7914/3 | Outer spring spacer (.058) | As req'd | .007 |
| 85 | SC 1110-1 | Outer spring spacer (.083) | As req'd | .020 |
| 86 | SC 7950-1 | Governor end cover bolt (plain) | 7 | .008 |
| 87 | WA22-6CA | Operating lever stop cover bolt, lower | 2 | .007 |
| 88 | CV 7946 | Operating lever stop cover lock washer | 3 | .001 |
| 89 | CV 7945 | Operating lever stop cover, lower | 1 | .052 |
| 90 | SC 7950 | Operating lever stop cover, upper | 1 | .046 |
| 91 | NT6/8CA | Operating lever strip cover bolt, upper | 1 | .014 |
| 92 | SC350/16CA | Hex. nut, 1/4" N.F. | 2 | .031 |
| 93 | GA 7978 | Headless set screw, 1/4 x 1" N.F. | 2 | .093 |
| 94 | BG 793 | Governor end cover gasket | 1 | .012 |
| 95 | PK 795 | Operating lever shaft bushing | 2 | |
| ... | PG 797 | Operating lever shaft oil seal | 2 | .007 |
| ... | GA 79106 | Plug (for operating lever shaft bore) | 1 | |
| ... | | Breather gasket | 1 | |

SPARE PARTS CATALOG

MEMORANDA

SPARE PARTS CATALOG

FRONT POWER TAKE-OFF COUPLING UNIT

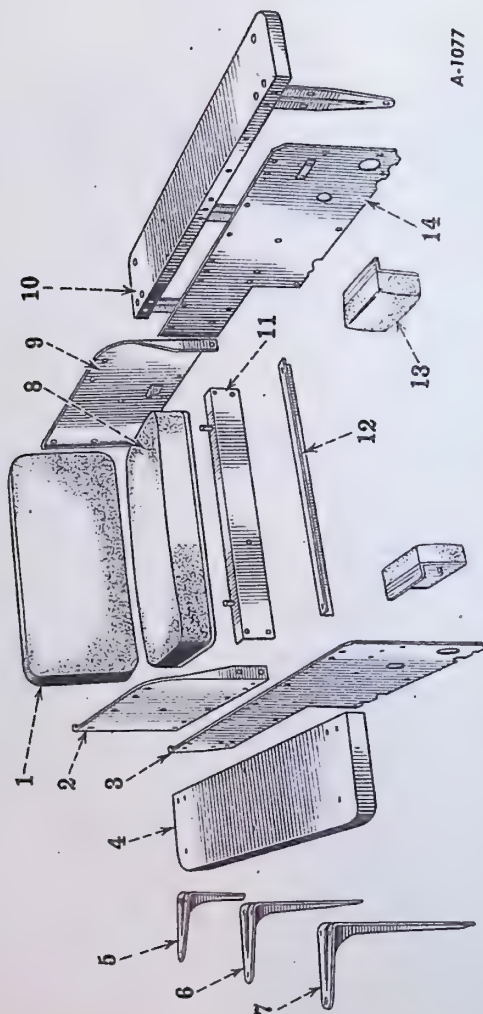


A-1322

| Ref. No. | I H C Part No. | Description. | No. Used | Weight Lbs. |
|-------------|-------------------|---------------------------------|-------------|----------------|
| 1 | 47490 D | Pin | 2 | |
| 2 | 47487 D | Key (No. 23 Woodruff) | 2 | |
| 3 | 6517 DX | Pulley with drive pins. | 1 | |
| 4 | 47489 D | Stud. | 6 | |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 6 | .031 |
| 5 | 36794 D | Vibration damper. | 1 | 16.000 |
| 6 | 18767 D | Lock washer | 1 | .062 |
| 7 | 6516 D | Nut | 1 | |
| 8 | 47488 D | Coupling (11 teeth) | 1 | |
| 9 | 47491 D | Shaft retainer. | 2 | |
| 10 | 47492 D | Felt washer | 1 | |
| 11 | 47493 D | Felt retainer | 2 | |
| 12 | 36795 DA | Lock. | 3 | .062 |
| 13 | 57624 D | Starting crank adapter | 1 | |

SPARE PARTS CATALOG

SEAT AND FENDERS



A-1077

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

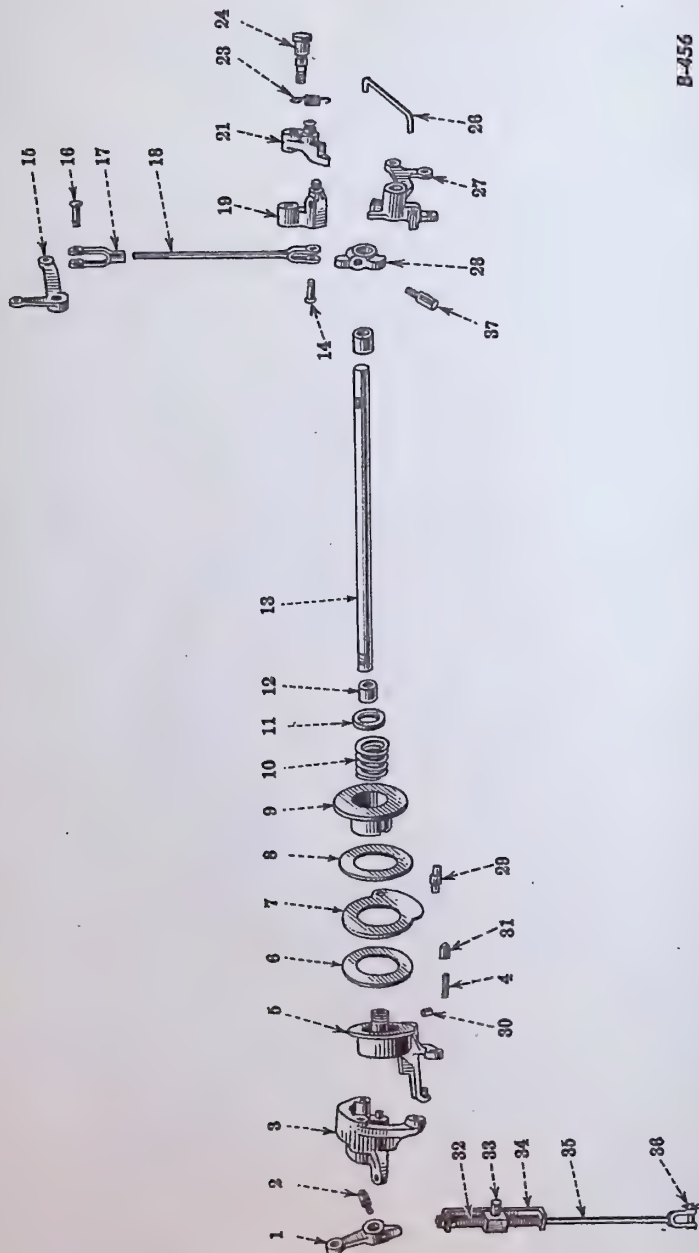
SPARE PARTS CATALOG

SEAT AND FENDERS - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--------------------------------|----------|----------|----------|----------------|---|----------|----------|
| 1 | 42635 D | Cushion (back) | 1 | 23.000 | 7 | 42624 D | Bracket, front. | 2 | 3.500 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 12 | .045 | ... | Q 1801 | Cap screw, 3/8 x 1" N.F. | 4 | .052 |
| ... | Q 1920 | Lock washer, 3/8" | 2 | .005 | ... | Q 1853 | Cap screw, 1/2 x 1-3/4" N.F. | 4 | .148 |
| 2 | 42628 DX | Seat side sheet, right hand. | 2 | 17.000 | ... | Q 1905 | Hex. nut, 3/8" N.F. | 4 | .031 |
| ... | Q 4016 | Cap screw, 3/8 x 5/8" N.C. | 4 | .041 | ... | Q 1909 | Hex. nut, 1/2" N.F. | 4 | .069 |
| ... | Q 1906 | Hex. nut, 3/8" N.C. | 2 | .031 | ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 | ... | Q 1922 | Lock washer, 1/2" | 6 | .013 |
| 3 | 41586 DX | Fender side sheet, right hand. | 1 | 12.000 | ... | Q 1846 | Cap screw, 1/2 x 3/4" N.C. | 2 | .092 |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 4 | .031 | ... | 42636 D | Cushion (bottom). | 1 | 23.000 |
| ... | Q 1920 | Lock washer, 3/8" | 5 | .005 | ... | 42627 DX | Seat side sheet, left hand. | 1 | 18.000 |
| ... | ... | Washer, 13/32 I.D. x 7/8" | 5 | .045 | ... | Q 4016 | Cap screw, 3/8 x 5/8" N.C. | 4 | .064 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 1 | .045 | ... | Q 1906 | Hex. nut, 3/8" N.C. | 2 | .031 |
| 4 | 42623 DA | Fender, right hand. | 1 | 23.000 | ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| ... | ... | Carriage bolt, 3/8 x 5/8" N.C. | 1 | .064 | ... | 42622 DA | Fender, left hand. | 1 | 27.000 |
| ... | Q 1799 | Cap screw, 3/8 x 3/4" N.F. | 9 | .045 | ... | ... | Carriage bolt, 3/8 x 5/8" N.C. | 9 | .064 |
| ... | Q 1906 | Hex. nut, 3/8" N.C. | 6 | .031 | ... | Q 1799 | Cap screw, 3/8 x 3/4" N.F. | 6 | .045 |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 9 | .031 | ... | Q 1906 | Hex. nut, 3/8" N.C. | 9 | .031 |
| ... | Q 1920 | Lock washer, 3/8" | 5 | .031 | ... | Q 1920 | Lock washer, 3/8" N.F. | 5 | .031 |
| ... | ... | Washer, 13/32 I.D. x 7/8" | 15 | .005 | ... | ... | Washer, 13/32 I.D. x 7/8" O.D. x 16 ga. | 15 | .005 |
| 5 | 42626 D | Bracket, rear. | 2 | 2.875 | 11 | 42629 DX | Seat support, front. | 2 | 6.000 |
| ... | Q 1847 | Cap screw, 3/8 x 1" N.F. | 2 | .052 | ... | Q 1799 | Cap screw, 3/8 x 3/4" N.F. | 1 | .045 |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 4 | .031 | ... | Q 1905 | Hex. nut, 3/8" N.F. | 4 | .031 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 8 | .089 | ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| ... | Q 1922 | Lock washer, 3/8" | 4 | .005 | ... | 42630 D | Seat support angle, rear. | 4 | 4.000 |
| ... | ... | Bracket, center. | 8 | .013 | ... | Q 1799 | Cap screw, 3/8 x 3/4" N.F. | 1 | .045 |
| 6 | 42625 D | Cap screw, 3/8 x 1" N.F. | 2 | 2.500 | ... | Q 1905 | Hex. nut, 3/8" N.F. | 2 | .031 |
| ... | Q 1801 | Cap screw, 1/2 x 3/4" N.C. | 2 | .052 | ... | 52390 D | Seat cushion side. | 2 | 2.500 |
| ... | Q 1846 | Hex. nut, 3/8" N.F. | 4 | .031 | ... | ... | Carriage bolt, 5/16 x 5/8" N.C. | 2 | .044 |
| ... | Q 1905 | Hex. nut, 1/2" N.F. | 4 | .069 | ... | Q 1904 | Hex. nut, 5/16" N.C. | 2 | .015 |
| ... | Q 1920 | Lock washer, 3/8" | 4 | .005 | ... | 41535 DX | Fender side sheet, left hand. | 4 | .003 |
| ... | Q 1922 | Lock washer, 1/2" | 6 | .013 | ... | Q 1920 | Hex. nut, 3/8" N.F. | 1 | .031 |
| ... | Q 1847 | Cap screw, 1/2 x 1" N.F. | 4 | .106 | ... | ... | Washer, 13/32 I.D. x 7/8" O.D. 16 ga. | 5 | .005 |
| ... | ... | ... | 4 | ... | ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 5 | .045 |
| ... | ... | ... | 4 | ... | ... | Q 1799 | Cap screw, 3/8 x 3/4" N.F. | 4 | .045 |

SPARE PARTS CATALOG

CROSS SHAFT AND GOVERNOR CONTROL



B-456

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

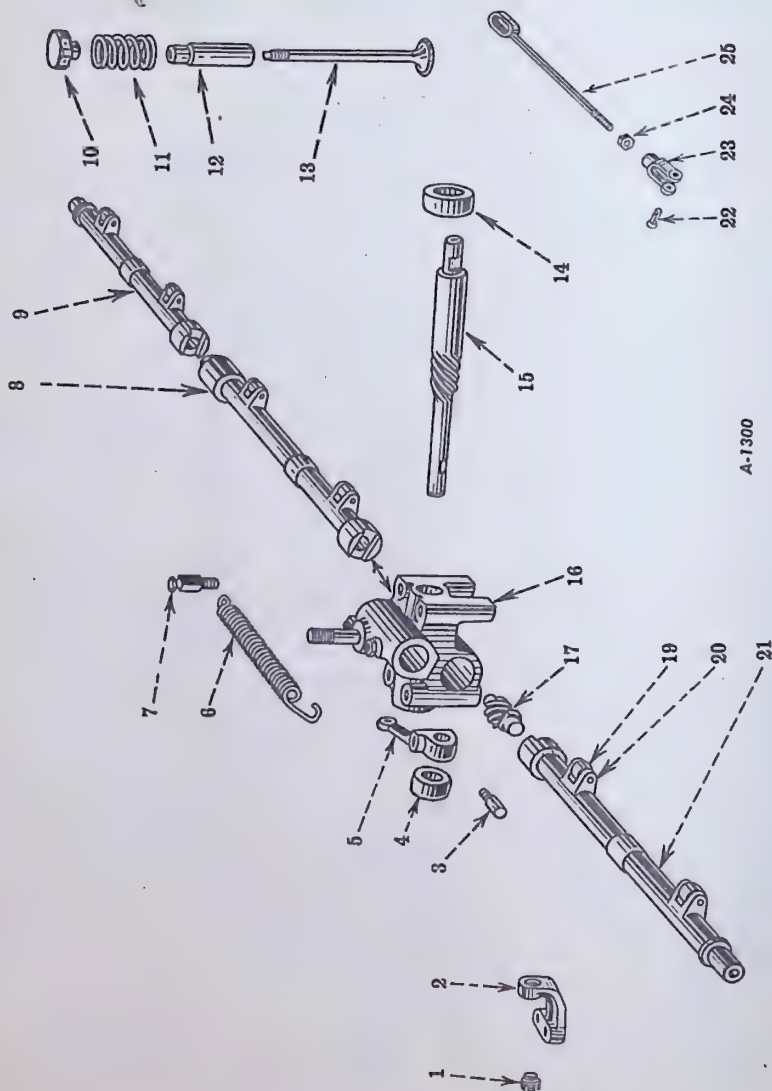
SPARE PARTS CATALOG

CROSS SHAFT AND GOVERNOR CONTROL - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|----------|----------------|-------------------------|----------|----------|
| 1 | 53123 D | Operating lever. | 1 | .375 | 21 | 52621 DX | Latch | 1 | .312 |
| 2 | 20586 D | Pin. | 1 | .050 | 23 | 52624 D | Latch spring. | 1 | .008 |
| ... | Q 1903 | Hex. nut, 5/16" N.F. | 1 | .015 | 24 | 55354 DA | Pin | 1 | .180 |
| ... | Q 1919 | Lock washer, 5/16" | 1 | .003 | 26 | 56463 D | Carburetor control rod. | 1 | .125 |
| 3 | 9446 DA | Bracket. | 1 | 2.875 | ... | ... | ... | ... | ... |
| ... | Q 1814 | Cap screw, 3/8 x 2-1/2" N.C. | 1 | .099 | ... | ... | ... | ... | ... |
| ... | ... | Cap screw, 3/8 x 1-3/8" N.C. | 2 | .068 | 27 | 8721 D | Jaw | 2 | .656 |
| ... | Q 1920 | Lock washer, 3/8" | 1 | .005 | ... | ... | ... | ... | ... |
| ... | ... | Oval point headless set screw, 5/16 x 1-1/4" N.C. | 3 | .023 | ... | ... | ... | ... | ... |
| ... | ... | Hex. jam nut, 3/8" | 1 | .045 | ... | ... | ... | ... | ... |
| 4 | 64545 D | Poppet spring. | 1 | 2.187 | ... | ... | ... | ... | ... |
| 5 | 9449 DX | Control lever, complete. | 1 | .050 | ... | ... | ... | ... | ... |
| 6 | 48356 D | Friction disc. | 2 | .375 | 28 | 52626 D | Jaw lever | 1 | .062 |
| 7 | 64543 D | Friction plate | 1 | .050 | 29 | 45391 D | Plate locating pin. | 1 | .062 |
| 8 | 48356 D | Friction disc. | 2 | .050 | 30 | 25115 D | Pin | 1 | .007 |
| 9 | 6649 D | Disc retainer. | 1 | 1.000 | 31 | 64544 D | Poppet. | 1 | .031 |
| 10 | 48358 D | Spring | 1 | .187 | 32 | 54125 D | Spring. | 2 | .020 |
| 11 | 48359 D | Spring nut | 1 | .125 | 33 | 42981 DA | Trunnion. | 1 | .250 |
| 12 | 50827 D | Bushing. | 2 | .081 | ... | ... | ... | ... | ... |
| 13 | 56460 D | Cross shaft. | 1 | 1.812 | ... | ... | ... | ... | ... |
| 14 | 19306 D | Pin. | 1 | .025 | ... | ... | ... | ... | ... |
| ... | 54457 DA | Cotter, 3/32 x 1/2" | 1 | .001 | ... | ... | ... | ... | ... |
| 15 | 10765 V | Cross shaft lever. | 1 | .500 | ... | ... | ... | ... | ... |
| 16 | ... | Pin. | 1 | .035 | ... | ... | ... | ... | ... |
| 17 | 58255 D | Cotter, 3/32 x 5/8" | 1 | .001 | ... | ... | ... | ... | ... |
| 18 | 56459 DBX | Adjusting yoke | 1 | .140 | ... | ... | ... | ... | ... |
| ... | ... | Operating rod. | 1 | .345 | ... | ... | ... | ... | ... |
| ... | ... | Hex. jam nut, 7/16" | 1 | .004 | ... | ... | ... | ... | ... |
| 19 | 8617 DX | N.F. | 1 | .500 | ... | ... | ... | ... | ... |
| ... | ... | Latch bracket. | 1 | .023 | ... | ... | ... | ... | ... |
| ... | ... | Flat point headless set screw, 3/8 x 1-1/2" N.C. | 1 | .004 | ... | ... | ... | ... | ... |
| ... | ... | Hex. jam nut, 3/8" | 1 | .023 | ... | ... | ... | ... | ... |

SPARE PARTS CATALOG

STARTING VALVE MECHANISM



A-1300

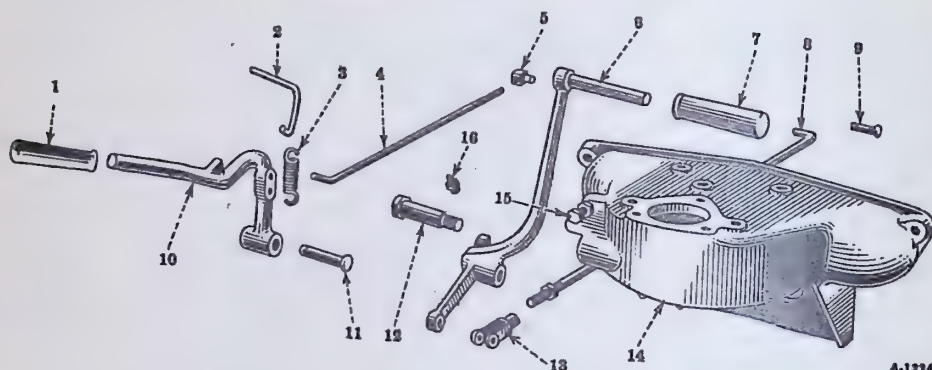
SPARE PARTS CATALOG

STARTING VALVE MECHANISM - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|------------------------------|----------|----------|----------|----------------|--|----------|----------|
| 1 | 42759 D | Cross shaft thrust screw | 1 | .062 | 16 | 5972 DX | Bracket. | 1 | 3.375 |
| ... | ..... | Cotter, 3/32 x 1-1/4" | 1 | .004 | ... | Q 1818 | Cap screw, 3/8 x 3" | 4 | .115 |
| 2 | 8720 DA | Cross shaft thrust bracket | 1 | .781 | ... | ..... | N.C. | 2 | |
| ... | Q 1854 | Cap screw, 1/2 x 1-3/4" N.C. | 2 | .148 | ... | ..... | Cup point headless set screw, 5/16 x 3/4" N.C. | 2 | |
| ... | Q 1922 | Lock washer, 1/2" | 2 | .013 | ... | ..... | Hex. jam nut, 5/16" N.C. | 2 | .013 |
| 3 | 20586 D | Pin. | 1 | .050 | ... | Q 1920 | Lock washer, 3/8" | 4 | .005 |
| ... | Q 1903 | Hex. nut, 5/16" N.F. | 1 | .015 | 17 | 32471 DA | Gear (8 teeth) | 1 | .250 |
| ... | Q 1919 | Lock washer, 5/16" | 1 | .003 | 19 | 24916 D | Roller | 6 | .031 |
| 4 | 42760 D | Oil seal | 1 | .125 | 20 | 24917 D | Pin. | 6 | .031 |
| 5 | 42754 DA | Inner lever | 1 | .250 | 21 | 32469 DX | Shaft, rear | 2 | 1.937 |
| 6 | 42755 D | Cross shaft spring | 1 | .327 | 22 | 14611 H | Air valve control rod | 2 | .013 |
| 7 | 42756 D | Spring anchor stud | 1 | .250 | ... | ..... | pin | 2 | |
| 8 | 32470 DX | Shaft, center | 1 | 1.937 | ... | ..... | Cotter, 1/16" x 7/16" | 2 | |
| 9 | 32469 DX | Shaft, front | 2 | .250 | 23 | 17730 D | Air valve control rod | 1 | .062 |
| 10 | 42750 D | Spring retainer | 6 | .003 | 24 | ..... | yoke | 1 | .007 |
| ... | ..... | Cotter, 3/32 x 1-1/2" | 6 | .082 | 25 | 42780 DX | Nut, 1/4", type "B" | 1 | .250 |
| 11 | 32479 D | Starting valve spring | 6 | .218 | ... | 14611 H | Air valve control rod, cp. | 1 | .013 |
| 12 | 5024 DAR | Guide | 6 | .036 | ... | ..... | Carburetor control rod | 1 | |
| 13 | 42749 D | Starting valve | 1 | .843 | ... | ..... | pin | 1 | |
| 14 | 22460 D | Oil seal | 1 |  | ... | ..... | pin | 1 | |
| 15 | 56456 D | Starting valve cross shaft | 1 |  | ... | ..... | pin | 1 | |

SPARE PARTS CATALOG

ENGINE CONTROLS



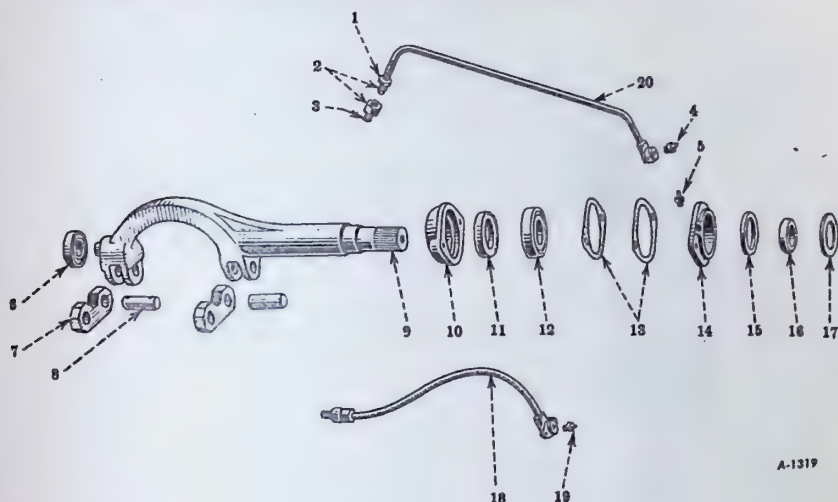
A-1324

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| 1 | 41597 D | Compression release lever handle (rubber) (see 9635 DA - Ref. No. 10) | 1 | .156 |
| 2 | 52405 D | Return spring link | 1 | .125 |
| 3 | 52404 D | Cotter, 1/8 x 3/4" | 1 | .003 |
| 4 | 58205 D | Return spring | 1 | .114 |
| 5 | Q 1905 | Compression release rod | 1 | .500 |
| 6 | 48906 D | Hex. nut, 3/8" N.F. | 1 | .031 |
| 7 | 8831 DAX | Cotter, 1/8 x 3/4" | 1 | .003 |
| 8 | 9647 DAX | Adjusting block | 1 | .062 |
| 9 | 9647 DAX | Cotter, 3/32 x 3/4" | 1 | .002 |
| 10 | 9647 DAX | Governor control lever with rubber handle (see 9647 DAX) | 1 | 3.125 |
| 11 | 41597 D | Governor control lever, complete (steel) (optional in place of 8831 DAX and 41597 D) | 1 | ..... |
| 12 | 58206 D | Governor control lever handle (rubber) (see 9647 DX - Ref. No. 6) | 1 | .156 |
| 13 | Q 1909 | Governor control rod | 1 | 1.500 |
| 14 | 15041 H | Hex. nut, 1/2" N.F. | 1 | .069 |
| 15 | 9015 DAX | Cotter, 1/8 x 3/4" | 1 | .003 |
| 16 | 9635 DA | Pin | 1 | .125 |
| 17 | 9635 DA | Cotter, 1/8 x 3/4" | 1 | .003 |
| 18 | 9635 DA | Compression release lever with rubber handle (see 9635 DA) | 1 | 3.187 |
| 19 | 9635 DA | Compression release lever, complete (steel) (optional in place of 9015 DAX and 41597 D) | 1 | ..... |
| 20 | H 4213 | Pivot pin | 1 | .250 |
| 21 | 52403 D | Lever shaft | 1 | .375 |
| 22 | 15033 H | Adjusting yoke | 1 | .291 |
| 23 | 8832 D | Control housing and air cleaner top | 1 | 38.500 |
| 24 | Q 1848 | Cap screw, 1/2 x 1" N.C. | 2 | .106 |
| 25 | Q 1922 | Cap screw, 1/2 x 1-3/8" N.C. | 3 | .148 |
| 26 | 55748 D | Lock washer, 1/2" | 5 | .013 |
| 27 | Q 1906 | Governor control lever stop screw | 1 | .250 |
| 28 | Q 3615 | Hex. nut, 3/8" N.C. | 1 | .031 |
| 29 | Q 3615 | Governor control lever lubricator (Lincoln No. 5000) | 1 | .015 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

STEERING CLUTCH AND RELEASE MECHANISM



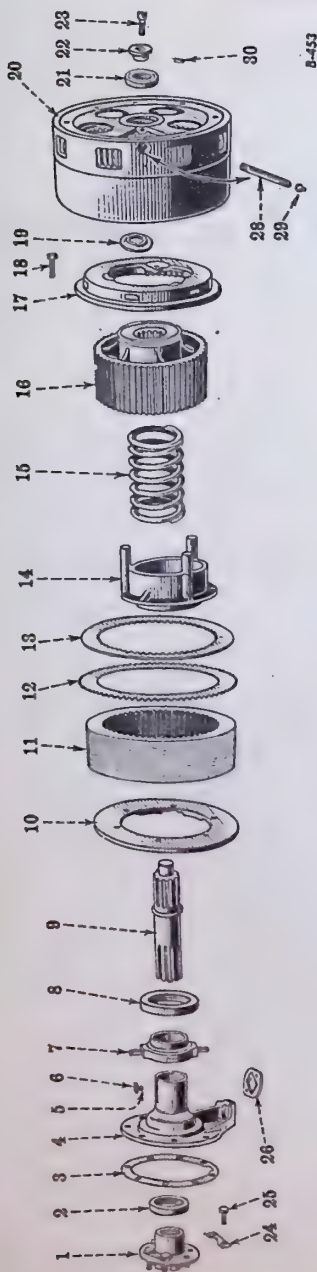
A-1319

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 1 | 29899 D | Connector nut | 2 | .001 |
| 2 | 35252 DX | Connector, with nut, complete | 2 | .062 |
| 3 | 35252 D | Connector | 2 | .031 |
| 4 | Q 3615 | Lower bearing lubricator (Lincoln No. 5000) | 2 | .015 |
| 5 | Q 3615 | Upper bearing lubricator, (Lincoln No. 5000) | 2 | .015 |
| 6 | M 89541 | Lower bearing (New Departure No. 8505) . . . | 2 | .250 |
| 7 | 56005 D | Collar shifter link | 4 | .812 |
| 8 | 56007 D | Shifter link pin | 4 | .250 |
| 9 | 57099 D | Cotter, 1/8 x 1-1/4" | 8 | .004 |
| 10 | 8682 DX | Release fork | 2 | 1.250 |
| 11 | 21969 D | Bearing cage | 2 | 6.156 |
| 12 | ST 205-A | Oil seal | 2 | .062 |
| 13 | 20308 D | Bearing (IHC) (optional) | 2 | .687 |
| 14 | 56009 D | Bearing (New Departure No. 3207) (optional) | 2 | .687 |
| 15 | 8680 DX | Gasket | 4 | .005 |
| 16 | Q 1834 | Retainer | 2 | .625 |
| 17 | Q 1921 | Cap screw, 7/16 x 1-1/2" N.C | 4 | .094 |
| 18 | 57103 DX | Lock washer, 7/16" | 4 | .01 |
| 19 | 57103 DX | Slotted headless pipe plug, 1/8" | 1 | .007 |
| 20 | 57103 DX | Felt | 2 | .125 |
| 21 | 57103 DX | Spacer | 2 | .083 |
| 22 | 57103 DX | Felt retainer | 2 | .375 |
| 23 | 57103 DX | Release bearing grease tube, assembly . . . | 2 | .029 |
| 24 | 57103 DX | Square head machine bolt, 1/4 x 3/4" N.C. . . | 4 | .007 |
| 25 | 57103 DX | Hex. nut, 1/4" N. | 4 | .007 |
| 26 | 57103 DX | Lock washer, 1/4" | 4 | .007 |
| 27 | 57103 DX | Release bearing lubricator (Lincoln No. 5000) | 2 | .015 |
| 28 | 57103 DX | Lower grease tube | 2 | .375 |
| 29 | 57103 DX | Square head bolt, 1/4 x 3/4" N.C. | 4 | .029 |
| 30 | 57103 DX | Hex. nut, 1/4" N.C. | 4 | .007 |
| 31 | 57103 DX | Lock washer, 1/4" | 4 | .002 |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

STEERING CLUTCH



| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--------------------------------------|----------|----------|
| ... | 40891 DD | Steering clutch. | 2 | 185.000 |
| 1 | 40890 D | Coupling (12 teeth). | 2 | 7.000 |
| 2 | 40880 D | Oil seal | 2 | .656 |
| 3 | 40929 D | Gasket | 2 | .061 |
| 4 | 8742 DX | Cage cap, left hand. | 1 | 21.000 |
| ... | 8743 DX | Cage cap, right hand. | 1 | 21.000 |
| ... | Q 1872 | Cap screw, 5/8 x 1-3/4" N.C. | 12 | .238 |
| ... | Q 1911 | Hex. nut, 5/8" N.F. | 4 | .127 |
| ... | Q 1925 | Lock washer, 5/8" | 16 | .013 |
| 5 | 56006 D | Key pin. | 2 | .005 |
| 6 | 56013 DX | Collar key | 2 | .001 |

(Continued on next page)

SPARE PARTS CATALOG

STEERING CLUTCH - Continued

| | | | | |
|----|------------|--|------|--------|
| 7 | 56018 D | Release collar | 1/8" | 4.500 |
| 8 | 53233 DA | Close pipe nipple, | 1/8" | 2.000 |
| 9 | 40877 DB | Bearing (Aetna) | | 22.000 |
| 10 | 5715 D | Shaft | | 16.500 |
| 11 | Q 1850 | Plate | | .120 |
| 12 | Q 1922 | Cap screw, 1/2 x 1-1/4" N.C. | | .013 |
| 13 | (See Note) | Lock washer, 1/2" | | 1.875 |
| 14 | 40882 D | Disc (external teeth) | | 1.125 |
| 15 | 40883 DB | Disc (internal teeth) | | 14.375 |
| 16 | 5712 DB | Retainer | | 11.750 |
| 17 | 68462 D | Spring | | 52.000 |
| 18 | 9717 D | Hub | | 21.500 |
| 19 | 5711 DB | Pressure plate | | .125 |
| 20 | 54968 D | Pressure plate dowel bolt | | .013 |
| 21 | Q 1922 | Lock washer, 1/2" | | .500 |
| 22 | 53742 DA | Spacer | | 91.000 |
| 23 | 5714 DD | Drum | | .194 |
| 24 | Q 1867 | Cap screw, 5/8 x 1-1/4" N.F. | | .013 |
| 25 | Q 1925 | Lock washer, 5/8" | | 1.031 |
| 26 | 53389 D | Pilot bearing | | .187 |
| 27 | 50098 DA | Pilot bearing retainer | | .187 |
| 28 | 50098 DAX | Retainer with pin | | .125 |
| 29 | 50099 D | Pilot bearing retainer bolt | | .013 |
| 30 | Q 1922 | Lock washer, 1/2" | | .031 |
| 31 | 48178 DA | Bolt lock | | .104 |
| 32 | 50822 D | Coupling bolt | | .250 |
| 33 | 57102 D | Fork lower bearing cap | | .028 |
| 34 | Q 1904 | Slotted flat head bolt, 5/16 x 1-1/4" N.C. | | .015 |
| 35 | Q 1919 | Hex. nut, 5/16" N.C. | | .003 |
| 36 | 54652 D | Lock washer, 5/16" | | .125 |
| 37 | 54652 D | Lubricator pipe | | .010 |
| 38 | Q 3618 | Lubricator (Lincoln No. 5060) | | .004 |
| 39 | 57750 D | Pin | | |

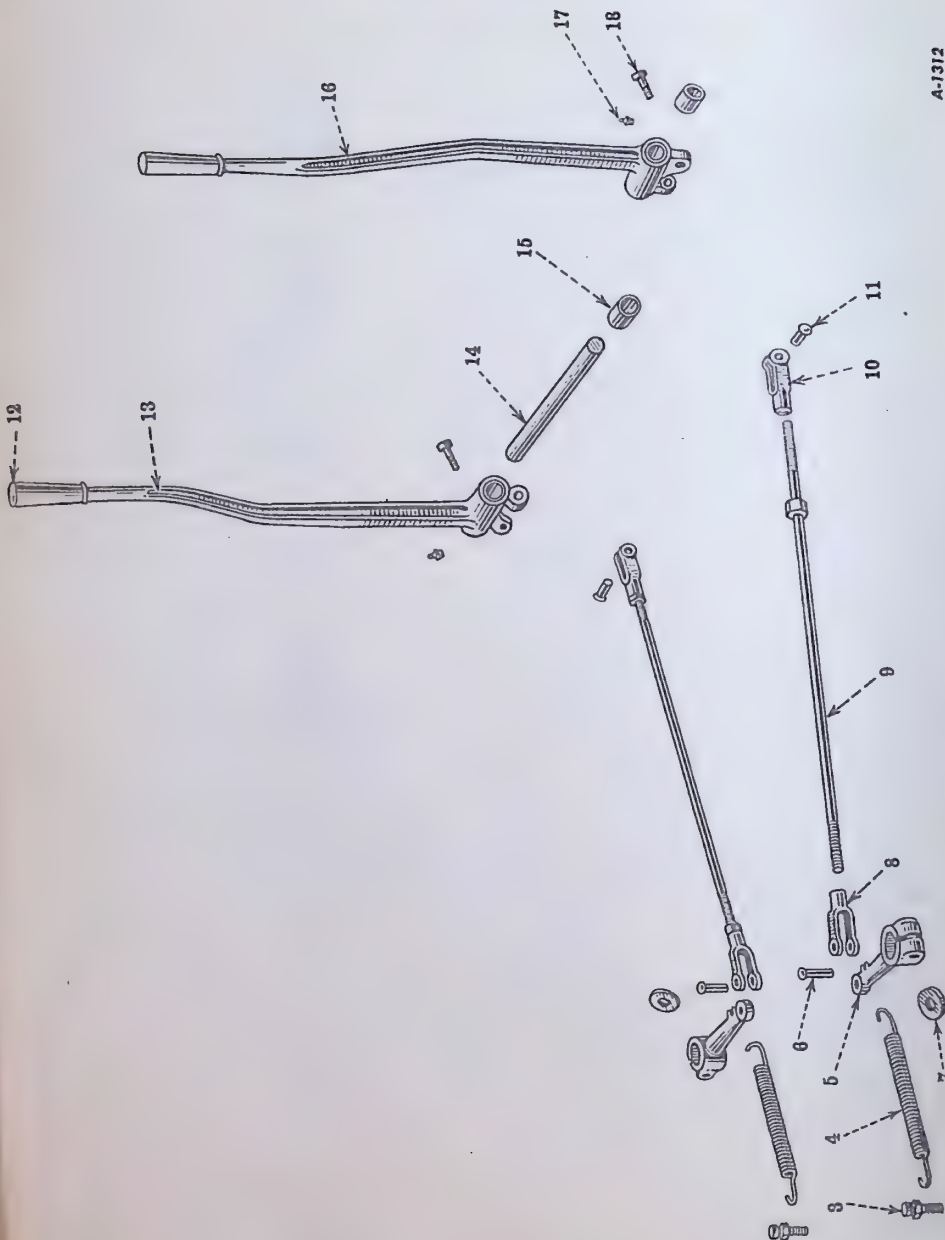
NOTE: This assembly is made up of a group of friction discs (Ref. 12) and driving discs (Ref. 13).

SPARE PARTS CATALOG

STEERING CLUTCH CONTROLS

A-1312

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.



Don't order parts from the illustrations only; refer to the list also.

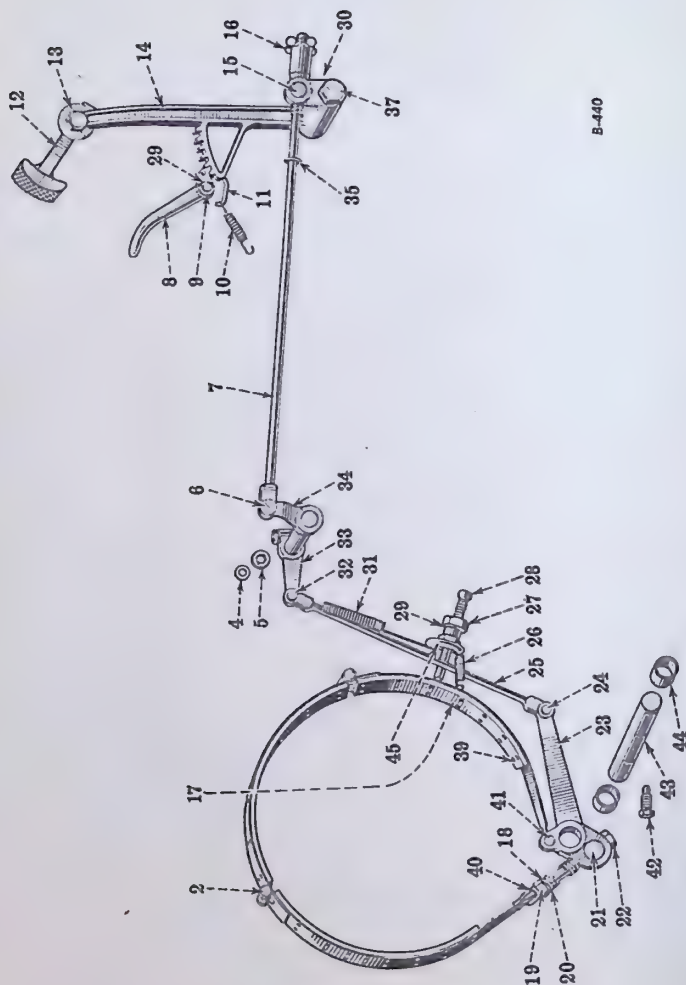
SPARE PARTS CATALOG

STEERING CLUTCH CONTROLS - Continued

| Ref. No. | I H C Parts No. | Description | No. Used | Wt. Lbs. |
|-------------|--------------------|--|-------------|-------------|
| 3 | 41768 D | Spring anchor. | 2 | .142 |
| ... | Q 1922 | Lock washer, 1/2". | 2 | .013 |
| 4 | 57288 D | Return spring. | 2 | .375 |
| 5 | 8679 DA | Release lever. | 2 | 1.500 |
| ... | Q 1813 | Cap screw, 3/8 x 2-1/2" N.F. | 2 | .099 |
| ... | Q 1905 | Hex. nut, 3/8" N.F. | 2 | .031 |
| ... | Q 1920 | Lock washer, 3/8". | 2 | .013 |
| 6 | 15041 H | Pin. | 2 | .081 |
| ... | ..... | Cotter, 1/8 x 3/4". | 2 | .003 |
| 7 | 45794 D | Release lever retaining washer | 1 | .125 |
| ... | ..... | Cap screw, 1/2 x 1-1/4" N.F. | 2 | .120 |
| ... | Q 1922 | Lock washer, 1/2". | 2 | .013 |
| 8 | 63228 D | Steering clutch operating rod yoke (left hand thread). | 2 | .312 |
| 9 | 63230 DX | Operating rod. | 2 | 2.000 |
| ... | ..... | Hex. jam nut, 1/2" N.C. (right hand thread). | 2 | .046 |
| 10 | 63228 D | Hex. jam nut, 1/2" N.C. (left hand thread). | 2 | .046 |
| 11 | 15041 H | Steering clutch operating rod yoke (right hand thread) | 2 | .312 |
| ... | ..... | Pin. | 2 | .081 |
| ... | ..... | Cotter, 3/32 x 3/4". | 4 | .002 |
| 12 | 41597 D | Steering clutch lever handle (rubber) (see 9641 DAX, Ref. No. 13 and 9642 DX, Ref. No. 16) | 2 | .156 |
| 13 | 8683 DAX | Steering clutch lever, left hand, with bushings and rubber handle (see 9641 DAX). | 1 | 5.628 |
| ... | 9641 DAX | Steering clutch lever, left hand, complete (steel) (optional in place of 8683 DX and 41597 D) | 1 | ... |
| 14 | 56012 D | Shaft. | 1 | ... |
| ... | Q 1784 | Cap screw, 5/16 x 2" N.C. | 1 | 2.500 |
| ... | Q 1919 | Lock washer, 5/16". | 1 | .057 |
| 15 | 42175 D | Bushing. | 1 | .003 |
| ... | 8684 DAX | Steering clutch lever, right hand, with bushings and rubber handle (see 9642 DAX). | 4 | .093 |
| 16 | 9642 DAX | Steering clutch lever, right hand, complete (steel) (optional in place of 8684 DAX and 41597 D). | 1 | 5.628 |
| 17 | Q 3615 | Lubricator (Lincoln No. 5000). | 1 | ... |
| 18 | 56277 D | Screw. | 2 | .015 |
| ... | ..... | Hex. jam nut, 1/2" N.F. | 2 | .187 |
| ... | ..... | ..... | 2 | .046 |

SPARE PARTS CATALOG

STEERING BRAKES AND CONTROLS



B-440

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

STEERING BRAKES AND CONTROLS - Continued

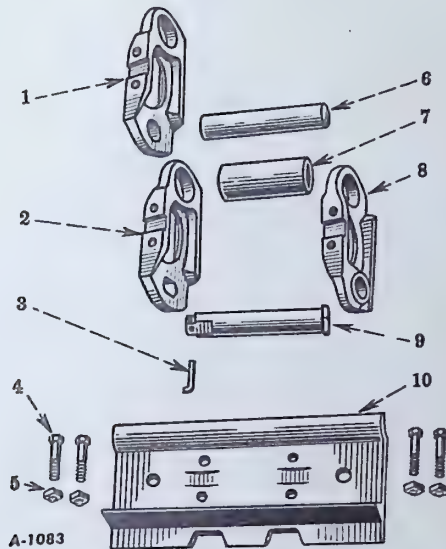
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|--|----------|----------|
| ... | 60260 DA | Brake band assembly, (includes linings, rivets and joint pins) | 2 | 16.532 | 23 | 5801 DX | Lever. | 2 | 4.250 |
| 2 | 60259 D | Pin. | 4 | .250 | 24 | 15041 H | Pin. | 2 | .125 |
| 4 | 20841 D | Cotter, 1/8 x 1-1/4" | 4 | .004 | 25 | 56475 D | Cotter, 1/8 x 7/8" | 2 | .003 |
| 5 | 41519 D | Key for lever, inner. | 2 | .005 | 26 | 56478 D | Rod, inner. | 2 | .125 |
| 6 | 15041 H | Seal | 2 | .031 | | | Anchor spring. | 2 | .001 |
| 7 | 41512 DA | Rod pin. | 2 | .003 | | | Anchor spring with hook. | 2 | .031 |
| 8 | 5818 D | Cotter, 1/8 x 3/4" | 2 | .125 | 27 | Q 1912 | Nut, 5/8" N.C. | 2 | .127 |
| 9 | 41523 D | Rod, outer. | 2 | .003 | 28 | 41495 D | Set screw. | 2 | .375 |
| 10 | 41935 D | Pawl stud. | 2 | 1.750 | 29 | 3621 | Lock washer, 1" | 2 | ..... |
| ... | Q 1773 | Pawl | 2 | .500 | 30 | Q 3621 | Pedal shaft lubricator (Lincoln No. 5300). | 2 | .031 |
| 11 | 41521 D | Pawl link, left hand. | 2 | .013 | 31 | 41515 D | Release spring. | 2 | .156 |
| 12 | 5815 D | Pawl link, right hand. | 1 | .062 | 32 | 41999 D | Pin, upper. | 2 | .006 |
| 13 | 41524 D | Cotter, 1/16 x 1/2" | 2 | .045 | 33 | 5813 DA | Cotter, 1/8 x 3/4" | 2 | .003 |
| 14 | 5816 DB | Pedal pad. | 2 | .250 | | | Lever, inner. | 2 | .750 |
| 15 | 5817 DB | Swivel. | 2 | .201 | | | Cap screw, 1/2 x 1-5/8" N.C. | 2 | .148 |
| 16 | 5812 D | Lock washer, 3/4" | 2 | .045 | | | Lock washer, 1/2" | 2 | .013 |
| 17 | 68628 D | Pedal, left hand. | 1 | 7.000 | 34 | 41418 D | Lever, outer, left hand. | 1 | 2.000 |
| 18 | 41496 D | Pedal, right hand. | 1 | 7.000 | 35 | 41509 D | Lever, outer, right hand. | 1 | 2.000 |
| 19 | Q 1911 | Pivot pin. | 2 | .500 | 36 | 41520 D | Washer. | 2 | .005 |
| 20 | 41497 D | Adjustable knob. | 2 | 1.000 | 37 | 21407 H | Pedal shaft. | 2 | 2.000 |
| 21 | 41501 D | (Set of three) brake band linings with rivets. | 2 | .012 | 39 | 61175 V | Lining rivet (.186 x 7/16") | 80 | .004 |
| 22 | 41499 D | Hex. nut, 5/8" N.F. | 2 | .127 | 40 | 41498 D | Lining rivet (.186 x 1/2") | 16 | ..... |
| | | Spring. | 2 | .062 | 41 | 41500 DA | Adjusting bolt spacer. | 2 | .041 |
| | | Pin. | 2 | 1.000 | 42 | 41491 D | Pin. | 2 | .343 |
| | | Bolt | 2 | .562 | 43 | Q 1922 | Cotter, 3/16 x 1-1/2" | 2 | .013 |
| | | | 2 | | 44 | 41492 D | Shaft stud. | 2 | .125 |
| | | | 2 | | 45 | 41493 D | Lock washer, 1/2" | 2 | .013 |
| | | | 2 | | 46 | 45664 DA | Pivot shaft. | 2 | 2.125 |
| | | | 2 | | 47 | ..... | Bushing. | 4 | .062 |
| | | | 2 | | 48 | ..... | Anchor. | 2 | .250 |
| | | | 2 | | 49 | 56476 D | Hex. jam nut, 1" N.C. | 2 | .262 |
| | | | 2 | | 50 | ..... | Anchor spring hook. | 4 | .012 |

SPARE PARTS CATALOG

MEMORANDA

SPARE PARTS CATALOG

TRACK LINK PIN AND SHOE ASSEMBLY



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

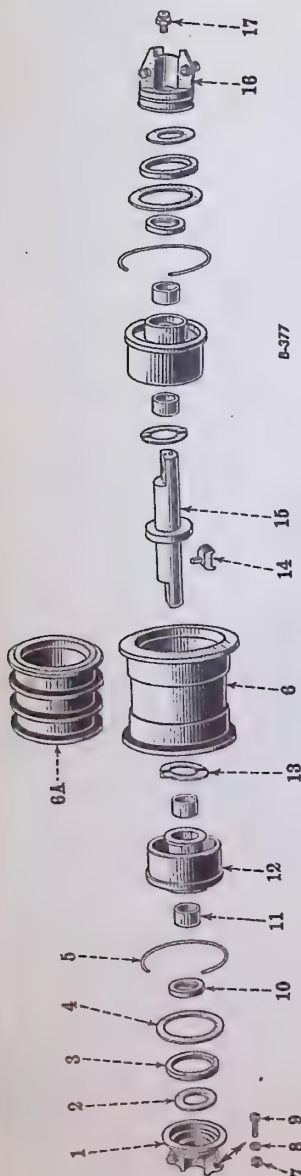
| Reef. Nco. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|---------------|-------------------|-------------------------------------|-------------|-------------|
| .... | 65100 D | Track | 2 | 1005.000 |
| .... | 65102 D | Track with 20" track shoes. | 2 | |
| 1 | 40977 DB | Link, right hand. | 72 | 9.000 |
| 2 | 40978 DB | Master link | 2 | 9.250 |
| 3 | 40980 DB | Lock wire | 2 | .062 |
| 4 | 40986 DB | Cap screw | 296 | .250 |
| 5 | 58075 DA | Nut | 296 | 4.250 |
| ... | Q 1925 | Lock washer, 5/8" | 296 | .013 |
| 6 | 40982 DA | Pin | 72 | 5.125 |
| 7 | 40981 D | Bushing | 74 | 3.812 |
| 8 | 40976 DB | Link, left hand | 74 | 9.093 |
| 9 | 40979 D | Master link pin | 2 | 5.312 |
| 10 | 46045 DA | Shoe, 20" | 74 | 32.500 |

When ordering, always use I H C Part Nos.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

TRACK ROLLER ASSEMBLY

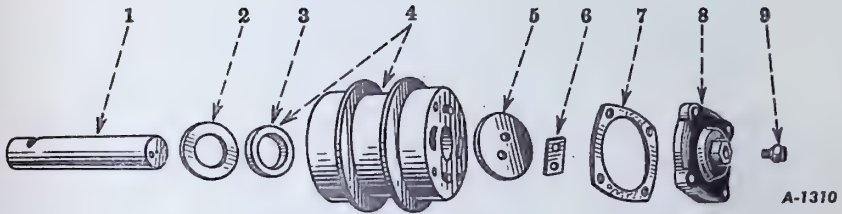


| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|----------|---|---|----------|----------|
| ... | 56133 D | Track roller, complete (first, third and fifth rollers). (As illustrated, less Ref. Nos. 1, 6A, 7, 8, 9 and 16) | 6 | | 6A | 41400 DA | Roller (double flange) | 4 | 65.000 |
| ... | 56134 D | Track roller, complete (second and fourth rollers). (As illustrated, less Ref. Nos. 1, 6, 7, 8, 9 and 16) | 4 | | 7 | Q 1911 | Nut, 5/8" N.F. | 40 | .127 |
| | | | | | 8 | Q 1925 | Lock washer, 5/8" | 40 | .013 |
| | | | | | 9 | 37293 DA | Bolt | 40 | .281 |
| | | | | | 10 | 40992 DA | Oil seal | 20 | .500 |
| | | | | | 11 | 42972 DX | Carrier bushing (set) | 10 | 1.562 |
| | | | | | 12 | 5734 DY | Carrier (set). (Includes Ref. Nos. 2, 3, 4, 5, 10, 11, 12 and 13) | 10 | 42.00 |
| | | | | | 13 | 41404 DAX | Thrust washer (set) | 10 | .500 |
| | | | | | 14 | 5733 D | Oil scupper | 10 | .500 |
| | | | | | 15 | 52422 D | Shaft | 10 | 18.250 |
| | | | | | 16 | 8367 D | Bracket, outer | 10 | 7.000 |
| 1 | 5735 D | Bracket (inner) | 10 | 5.500 | 17 | 37290 D | Lubricator (Lincoln No. 5750) | 10 | .129 |
| 2 | 40933 D | Felt washer, outer | 20 | .031 | | or | | | |
| 3 | 41408 D | Felt washer, center | 20 | .043 | 17829 DA | Lubricator (Alemite No. 1511) | 10 | | |
| 4 | 41405 DA | Cork washer, inner | 20 | .062 | | | | | |
| 5 | 41406 D | Snap ring | 20 | .125 | | | | | |
| 6 | 41402 DA | Roller (single flange) | 6 | 56.000 | | | | | |

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

TRACK IDLER ASSEMBLY



A-1310

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

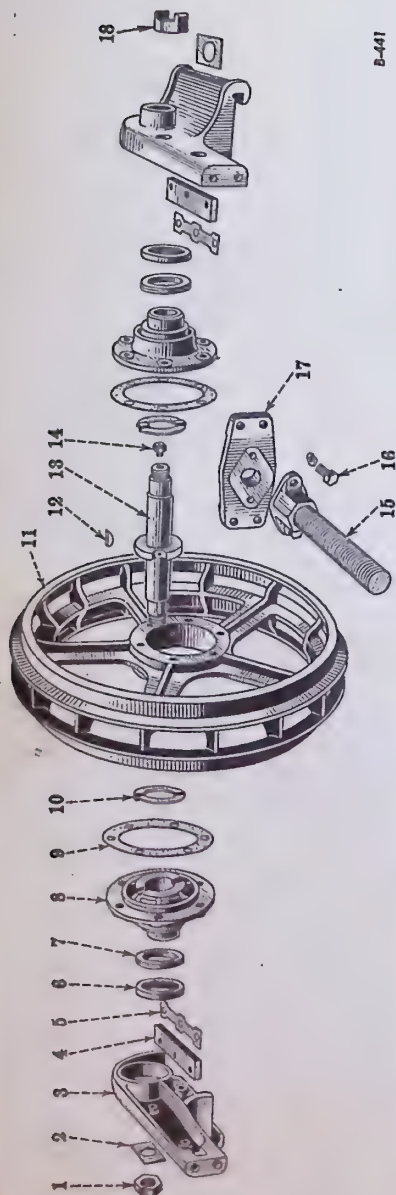
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------------------|--|----------|----------|
| ... | 67156 D | Track idler assembly (as illustrated) | ... | 33.500 |
| 1 | 40987 D | Shaft | 4 | 13.062 |
| 2 | 40993 D | Washer. | 4 | .031 |
| 3 | 60250 D | Seal. | 4 | .250 |
| 4 | 5725 DBX | Idler and seal. | 4 | 40.000 |
| 5 | 40988 D | Washer. | 4 | 1.500 |
| ... | Q 1849 | Cap screw, 1/2 x 1-1/4" N.F. | 8 | .120 |
| 6 | 40991 DA | Lock. | 4 | .015 |
| 7 | 42101 D | Gasket. | 4 | .005 |
| 8 | 5726 D | Cap | 4 | 4.000 |
| ... | ..... | Cap screw, 1/2 x 1-5/8" N.C. | 16 | .148 |
| ... | Q 1922 | Lock washer, 1/2" | 16 | .013 |
| 9 | { 37290 D or 17829 A | Lubricator (Lincoln No. 5750) Lubricator (Alemite No. 1511) | 4 4 | .125 |

When ordering, always use I H C Part Nos.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

FRONT IDLER ASSEMBLY

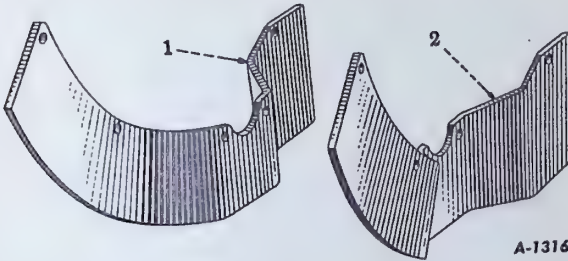


B-441

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|--|----------|----------|
| 1 | ..... | Hex. jam nut, 1-1/2" N.F. | 2 | .850 | 14 | 37290 D | Lubricator (Lincoln No. 5750) | 2 | .125 |
| 2 | 41866 D | Nut lock | 4 | .100 | 15 | 41853 DB | Adjuster | 2 | 14.000 |
| 3 | 5869 DBX | Guide, outer, left hand and inner, right hand. | 1 | 43.500 | 16 | ..... | Cadmium plated lock washer, 5/8" Bolt, 5/8 x 1-1/2" N.F. | 4 | ..... |
| 4 | 5870 DBX | Guide, inner, left hand and outer, right hand. | 1 | 42.000 | 17 | 5873 D | Cross plate. | 4 | ..... |
| 5 | 41861 D | Retainer | 4 | 3.000 | 18 | ..... | Cap screw, 3/4 x 2-1/2" N.C. | 2 | 13.500 |
| 6 | Q 1872 | Lock | 12 | .238 | Q 1927 | ..... | Lock washer, 3/4" | 8 | .446 |
| 7 | 49104 D | Seal | 4 | .208 | 41865 D | ..... | Nut, outer | 8 | .045 |
| 8 | 41862 D | Washer | 4 | .375 | 15944 D | ..... | Front idler carrier bolt nut. | 2 | 1.000 |
| 9 | 5875 DBX | Carrier | 4 | .062 | 22307 H | ..... | Front idler carrier bolt lock washer (Shakeproof No. 1228) | 12 | .125 |
| 10 | 41869 D | Gasket | 4 | 20.250 | 42971 DX | ..... | Carrier bushing. | 12 | .005 |
| 11 | 41404 DAX | Thrust washers (set of two) | 4 | .015 | 57734 D | ..... | Front idler carrier bolt. | 2 | .468 |
| 12 | 5874 D | Idler | 2 | .500 | ..... | ..... | ..... | 12 | .500 |
| 13 | SA 3215 | Key (Woodruff No. G) | 2 | 220.000 | ..... | ..... | ..... | ..... | ..... |
| 14 | 41868 D | Shaft | 2 | .083 | ..... | ..... | ..... | ..... | ..... |

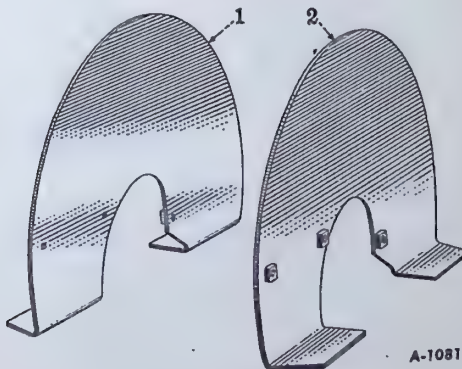
SPARE PARTS CATALOG

SPROCKET ROCK DEFLECTOR



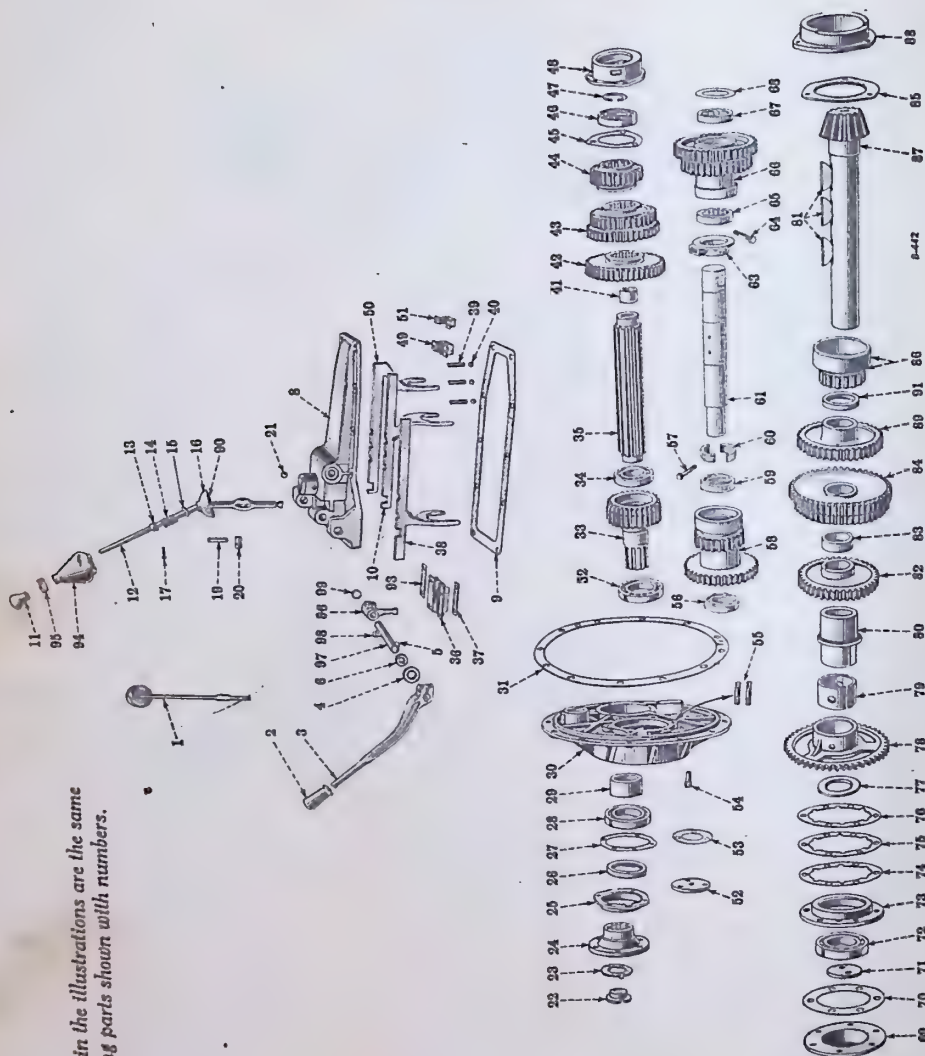
| Rdef. N ^o . | I H C Part No. | Description | No. Used | Wt. Lbs. |
|---------------------------|-------------------|----------------------------------|-------------|-------------|
| 1 | 41896 DA | Deflector, left hand | 1 | 14.000 |
| ... | Q 1855 | Cap screw, 1/2 x 2" N.F. | 5 | .162 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 5 | .069 |
| ... | Q 1922 | Lock washer, 1/2" | 5 | .013 |
| 2 | 41897 DA | Deflector, right hand | 1 | 15.156 |
| ... | Q 1855 | Cap screw, 1/2 x 2" N.F. | 5 | .162 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 5 | .069 |
| ... | Q 1922 | Lock washer, 1/2" | 5 | .013 |

FRONT IDLER SHIELD



| RRef. N ^o . | I H C Part No. | Description | No. Used | Wt. Lbs. |
|---------------------------|-------------------|--------------------------------------|-------------|-------------|
| 1 | { 42874 DX | Shield, left hand, outer | 1 | 26.000 |
| ... | { 42874 DX | Shield, right hand, inner. | 1 | 26.000 |
| ... | Q 1922 | Cap screw, 1/2 x 1-7/8" N.F. | 6 | .178 |
| ... | Q 1922 | Lock washer, 1/2" | 6 | .013 |
| 2 | { 42875 DX | Shield, left hand, inner | 1 | 26.000 |
| ... | { 42875 DX | Shield, right hand, outer | 1 | 26.000 |
| ... | Q 1922 | Cap screw, 1/2 x 1-7/8" N.F. | 6 | .178 |
| ... | Q 1922 | Lock washer, 1/2" | 6 | .013 |

TRANSMISSION



Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

TRANSMISSION - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|---|----------|----------|
| 1 | 41694 DA | Oil level rod | 1 | .125 | | 42512 DAX | Shifter lever (less ball rubber)(see 67350 DX) | 1 | 2.500 |
| 2 | 41597 D | Hi-Lo shifter lever handle (rubber) (see 9638 DX, Ref. 3) | 1 | .156 | 12 | 67350 DX | Shifter lever with ball (cast iron) (optional in place of 42512 DAX and 53717 DA) | 1 | ..... |
| | 5938 DAX | Hi-Lo shifter lever with rubber handle (41597) (see 9638 DX) | 1 | 2.500 | 13 | 11373 D | Stop, upper | 1 | .031 |
| 3 | 9638 DX | Hi-Lo shifter lever, complete (steel) | 1 | 3.031 | 14 | 29547 D | Spring | 1 | .062 |
| | | (optional in place of 5938 DAX and 41597 D) | 1 | 3.031 | 15 | 17700 D | Stop, lower | 1 | .012 |
| | | Cap screw, 1/2 x 1-5/8" N.C. | 1 | .148 | 16 | 42496 DX | Shield (includes Ref. Nos. 17 and 90) | 1 | .500 |
| | | Lock washer, 1/2" x 1-1/8" N.C. | 1 | .013 | 17 | ..... | Rivet, 3/16 x 1-1/4" | 1 | .031 |
| 4 | 1922 | Washer | 1 | .062 | 19 | 40466 DX | Shaft, small (includes Ref. No. 21) | 1 | .125 |
| 5 | 64609 D | Key (Woodruff No. 9) | 1 | .007 | 20 | 40465 DX | Shaft, large (includes Ref. No. 21) | 1 | .156 |
| 6 | 7220 T | Seal | 1 | .020 | 21 | 13115 D | Plug | 2 | .006 |
| 8 | 17053 D | Housing (includes Ref. Nos. 21 and 99) | 1 | ..... | 22 | 41664 D | Nut | 1 | 1.000 |
| | 9456 DX | Cap screw, 3/8 x 1-1/8" N.C. | 2 | .060 | 23 | 41665 D | Lock | 1 | .250 |
| | | Cap screw, 3/8 x 7/8" N.C. | 4 | .048 | 24 | 41657 D | Flange | 1 | 6.500 |
| | | Cap screw, 1/2 x 1-1/2" N.C. | 4 | .134 | 25 | 5841 DX | Retainer with oil seal, front | 1 | 1.750 |
| | 1852 | Lock washer, 3/8" x 1/2" | 4 | .005 | | Q 1801 | Cap screw, 3/8 x 1" N.C. | 4 | .052 |
| | 1920 | Lock washer, 1/2" x 3/8" | 6 | .005 | | Q 1920 | Oil seal | 4 | .005 |
| | 1922 | Lock washer, 1/2" x 3/8" | 4 | .013 | 26 | 52348 D | Gasket | 1 | .500 |
| 9 | 42511 D | Second and third shift rail | 1 | .037 | 27 | 41666 D | Bearing, front (New Departure No. 1214-VL) (optional) | 1 | .006 |
| 10 | 64615 D | Shifter lever ball (rubber) used with 42512 DAX (see 9637 D) | 1 | ..... | 28 | 23276 H | Bearing, front (New Departure No. 1214-VL) (optional) | 1 | 2.560 |
| | 53717 DA | Shifter lever ball (rubber) used with 42512 DAX (see 9637 D) | 1 | .187 | | ST 223 | Bearing, front (IHC) (optional) | 1 | 2.560 |
| 11 | 9637 D | Shifter lever ball (cast iron) (use with lever 67350 DX) | 1 | ..... | 29 | 41690 D | Spacer | 1 | 1.500 |
| | | | 1 | ..... | 30 | 64620 D | Cover with studs | 1 | 53.500 |
| | | | 1 | ..... |  | Q 1852 | Cap screw, 1/2 x 1-1/2" N.C. | 8 | .134 |
| | | | 1 | ..... |  | Q 1910 | Hex. nut, 1/2" N.C. | 4 | .069 |
| | | | 1 | ..... |  | Q 1922 | Lock washer, 1/2" x 1/2" | 12 | .013 |
| | | | 1 | ..... | 31 | 41668 DA | Gasket | 1 | .062 |

SPARE PARTS CATALOG

TRANSMISSION - Continued

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|---|----------|----------|
| 32 | 41513 V | Bearing, rear (New Departure No. 1215-YL) (optional) | 1 | 2.781 | 51 | 62780 DX | Lock (includes Ref. Nos. 37 and 93) | 1 | .062 |
| 33 | ST 228 | Bearing, rear (IHC) (optional) | 1 | 2.781 | 52 | 62780 D | Lock | 1 | .577 |
| 34 | 41643 D | Shaft and gear (29 teeth) | 1 | 15.750 | ... | 41670 D | Retainer | 1 | .052 |
| 35 | 64619 D | Bearing (New Departure No. 77212) | 1 | 2.000 | ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 3 | .120 |
| 36 | 41654 DX | Spline shaft with bushing | 1 | 19.750 | 53 | Q 1849 | Cap screw, 1/2 x 1-1/4" N.F. | 1 | .003 |
| 37 | 42517 D | Guide, front | 1 | 1.000 | 54 | 41680 D | Gasket | 1 | .125 |
| 38 | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 1 | .045 | 55 | 18585 DA | Pin | 1 | .125 |
| 39 | 62782 D | Lock, right hand | 1 | .031 | 56 | 64621 D | Stud | 2 | .069 |
| 40 | 64611 D | Shift rail | 1 | 3.375 | ... | Q 1909 | Hex. nut, 1/2" N.F. | 2 | .013 |
| 41 | 64163 D | Spring | 3 | .015 | 56 | Q 1922 | Lock washer, 1/2" N.F. | 2 | 1.093 |
| 42 | 4596 D | Gear shifter rail | 3 | .015 | 57 | 10690 V | Bearing (New Departure No. 1210 YL) | 1 | .125 |
| 43 | 13722 D | poppet ball (optional) | 3 | .015 | ... | 18501 DA | Hi-lo range idler bearing retainer bolt | 1 | ..... |
| 44 | 41671 D | Bushing | 1 | .156 | ... | ..... | Castle hex. nut, 3/8" N.F. | 1 | .002 |
| 45 | 41644 DA | Gear (42 and 29 teeth) | 1 | 15.750 | 58 | 56468 D | Cotter, 3/32 x 3/4" | 1 | 19.000 |
| 46 | 41649 DA | Gear (33 and 27 teeth) | 1 | 20.750 | 59 | 18511 D | Hi-lo idler gear (23 and 36 teeth) | 1 | .125 |
| 47 | 41653 DB | Gear (27 teeth) | 1 | 8.000 | 60 | 56465 D | Bearing (New Departure No. 3212) | 2 | .250 |
| 48 | 53899 D | Retainer, rear | 1 | .500 | 61 | 56467 D | Bearing retainer, rear | 1 | 21.812 |
| 49 | Q 1920 | Cap screw, 3/8 x 1-1/8" N.C. | 3 | .060 | 63 | 8334 D | Idle shaft | 1 | .375 |
| 50 | 14234 H | Lock washer, 3/8" | 3 | .005 | 64 | 21572 D | Oil scoop | 1 | .093 |
| 51 | ST 227 | Bearing (New Departure No. 1212 YL) (optional) | 1 | 1.870 | ... | ..... | Bolt | 1 | .016 |
| 52 | 40868 D | Ring | 1 | 1.870 | ... | ..... | Castle hex. nut, 3/8" N.F. | 1 | .002 |
| 53 | 8389 DA | Bearing cage, rear | 1 | .020 | 65 | 41681 D | Cotter, 3/32 x 3/4" | 1 | 1.500 |
| 54 | 42518 D | Guide, rear | 1 | 3.125 | 66 | 41681 D | Bearing (Hyatt No. 1210-TS) | 1 | 25.000 |
| 55 | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 2 | .045 | 67 | 41681 D | Reverse idler gear (31 and 38 teeth) | 1 | 1.500 |
| 56 | 64613 D | Low and reverse shift rail | 1 | 3.500 | ... | ..... | Bearing (Hyatt No. 1210-TS) | 1 | 1.500 |

SPARE PARTS CATALOG

TRANSMISSION - Continued

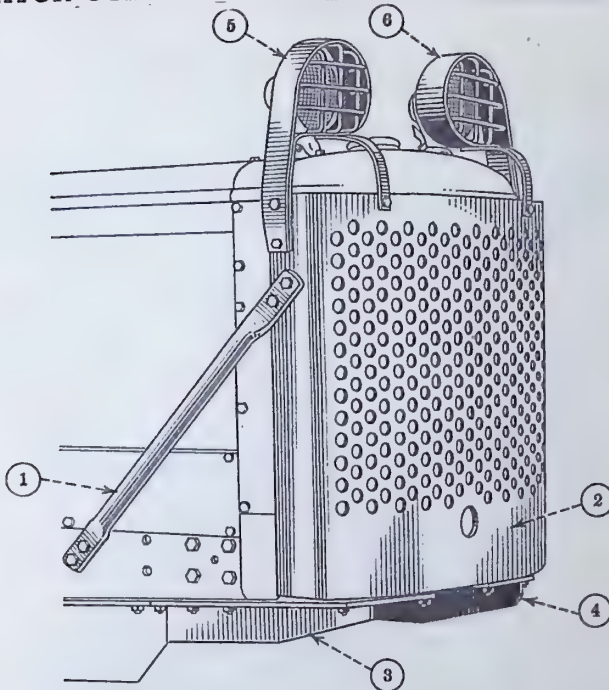
| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. | Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|----------|----------------|--|----------|----------|
| 68 | 41658 D | Washer. | 1 | .234 | 91 | 52893 D | Reverse gear spacer. | 1 | .750 |
| 69 | 5842 DA | Retainer, front | 1 | 3.750 | ... | 21491 H | High and low range idler shaft retainer bolt | | |
| ... | Q 1858 | Cap screw, $\frac{1}{2}$ x $2\frac{1}{4}$ " N.C. | 4 | .175 | | | Lock washer, $\frac{3}{8}$ " | 3 | .001 |
| 70 | Q 1922 | Lock washer, $1\frac{1}{2}$ " | 4 | .012 | | | (Shakeproof No. 1120). | | |
| 71 | 41662 DA | Gasket. | 1 | .012 | ... | 18868 D | High and low range idler shaft retainer bolt | | |
| 71 | 41677 D | Washer. | 1 | .457 | | | Lock washer, $1\frac{1}{2}$ " | 1 | .003 |
| ... | Q 1849 | Cap screw, $\frac{3}{8}$ x $1\frac{1}{4}$ " N.F. | 2 | .120 | | | (Shakeproof No. 1124) | | |
| ... | Q 1922 | Lock washer, $1\frac{1}{2}$ " | 2 | .013 | 93 | 62781 D | Gear shifter rail guide front bolt lock, left hand. | 1 | .062 |
| 72 | 55844 D | Bevel pinion shaft bearing, front (New Departure No. 5513). | 1 | 1.375 | 94 | 64603 D | Gear shifter boot. | 1 | .187 |
| 73 | 9457 D | Bearing cage, front | 1 | .062 | 95 | 64604 D | Gear shifter boot clamp | 1 | .020 |
| 74 | 41678 DA | Shim, heavy | 1 | 6.500 | ... | | Cadmium plated round head stove bolt, No. 8 - 32 x $\frac{3}{4}$ " | 1 | |
| 75 | 41679 DA | Shim, medium | 1 | .036 | | | Cadmium plated square stove bolt nut, No. 8 - 32" | 1 | .750 |
| 76 | 41680 DA | Shim, light | 1 | .750 | | | Hi-Lo gear shifter arm. | 1 | .120 |
| 77 | 5845 DA | Spacer, front | 1 | 7.000 | ... | Q 1922 | Cap screw, $1\frac{1}{2}$ x $1\frac{1}{4}$ " N.F. | 1 | .013 |
| 78 | 5837 DBX | Gear (47 teeth) | 1 | .046 | ... | Q 1922 | Lock washer, $1\frac{1}{2}$ " | 1 | 1.000 |
| 79 | 41672 DA | Bushing | 1 | 4.750 | 96 | 64606 D | Hi-Lo gear shifter arm shaft | 1 | .125 |
| 80 | 5843 DA | Sleeve. | 1 | .312 | ... | Q 1849 | Hi-Lo gear shifter arm key | 1 | .018 |
| 81 | 41661 D | Key | 3 | .750 | ... | Q 1849 | Gear shifter housing, assembly (Includes Ref. Nos. 2 thru 8, 10 thru 21, 36 thru 40, 49 thru 51, 90 and 93 thru 99). | 1 | |
| 82 | 41646 D | Gear (39 teeth) | 1 | 1.000 | ... | Q 1922 | Bevel pinion and shaft with drive bevel gear (includes Ref. Nos. 81 through 86 and 89). | 1 | |
| 83 | 41667 D | Spacer. | 1 | .060 | 97 | 64607 D | | | |
| 84 | 41645 DA | Gear (43 and 49 teeth). | 1 | .005 | 98 | 64608 D | | | |
| 85 | 41663 D | Retainer, rear. | 3 | 5.250 | 99 | 23007 V | | | |
| ... | Q 1804 | Cap screw, $\frac{3}{8}$ x $1\frac{1}{4}$ " N.C. | 3 | | ... | 52414 DA | | | |
| ... | Q 1920 | Lock washer, $\frac{3}{8}$ " | 3 | | | | | | |
| 86 | 53009 D | Bearing (roller assembly and outer race) (Iyatt No. BU-5215-Z). | 1 | 4.750 | | | | | |
| 87 | 64618 D | Matched set of bevel gear and pinion. (Includes pinion and shaft 87, also bevel gear (4) illustrated under Section 6, page 1). | 1 | 10.750 | | | | | |
| 88 | 5829 DA | Bearing cage, rear. | 1 | .010 | | | | | |
| 89 | 41647 DB | Gear (40 teeth) | 1 | | | | | | |
| 90 | 20887 DA | Swivel housing shield bushing. | 1 | | | | | | |

SPARE PARTS CATALOG

MEMORANDA

SPARE PARTS CATALOG

RADIATOR GUARD AND HEAD LAMP BRUSH GUARDS

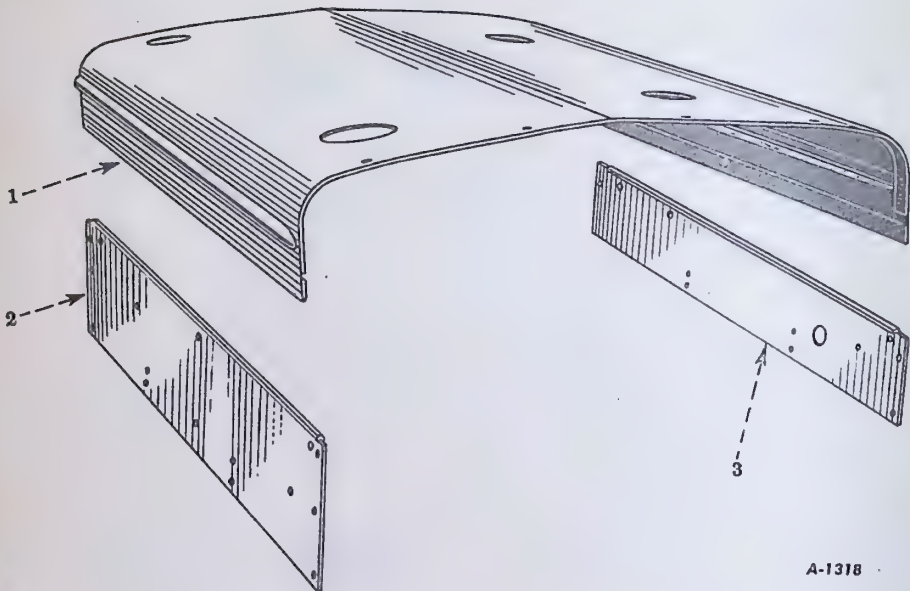


A-1317

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|--|----------|----------|
| 1 | 42898 DBX | Brace | 2 | 17.000 |
| ... | Q 1873 | Cap screw, 5/8 x 2" N.F. | 4 | .259 |
| ... | Q 1877 | Cap screw, 5/8 x 2-1/2" N.F. | 4 | .303 |
| ... | Q 1911 | Hex. nut, 5/8" N.F. | 8 | .127 |
| ... | Q 1925 | Lock washer, 5/8" | 8 | .013 |
| 2 | 62562 DX | Guard | 1 | 102.000 |
| ... | Q 1847 | Cap screw, 1/2 x 1" N.F. | 4 | .106 |
| ... | Q 1922 | Lock washer, 1/2" | 4 | .013 |
| 3 | 42897 DA | Bracket, right hand | 1 | 25.625 |
| ... | Q 1890 | Cap screw, 3/4 x 2" N.C. | 1 | .384 |
| ... | Q 4163 | Cap screw, 7/8 x 2" N.F. | 2 | .539 |
| ... | ... | Hex. nut, 7/8" N.F. | 2 | .313 |
| ... | Q 1927 | Lock washer, 3/4" | 1 | .045 |
| ... | Q 1929 | Lock washer, 7/8" | 2 | ..... |
| ... | ... | Washer, 11/16" I.D. x 1-1/2" O.D. x 11 ga. | 1 | ..... |
| 4 | 42896 DA | Bracket, left hand | 1 | 27.000 |
| ... | Q 1890 | Cap screw, 3/4 x 2" N.C. | 1 | .384 |
| ... | Q 4163 | Cap screw, 7/8 x 2" N.F. | 2 | .539 |
| ... | ... | Hex. nut, 7/8" N.F. | 2 | .313 |
| ... | Q 1927 | Lock washer, 3/4" | 1 | .045 |
| ... | Q 1929 | Lock washer, 7/8" | 2 | .050 |
| ... | ... | Washer, 11/16" I.D. x 1-1/2" O.D. x 11 ga. | 1 | ..... |
| 5 | 62550 D | Head lamp brush guard, right hand | 1 | 13.125 |
| ... | Q 1851 | Cap screw, 1/2 x 1-1/2" N.F. | 3 | .133 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 3 | .069 |
| ... | Q 1922 | Lock washer, 1/2" | 3 | .013 |
| 6 | 62549 D | Head lamp brush guard, left hand | 1 | 13.125 |
| ... | Q 1852 | Cap screw, 1/2 x 1-1/2" N.F. | 3 | .133 |
| ... | Q 1909 | Hex. nut, 1/2" N.F. | 3 | .069 |
| ... | Q 1922 | Lock washer, 1/2" | 3 | .013 |

SPARE PARTS CATALOG

HOOD AND SIDE SHEETS



A-1318

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

| Ref. No. | I H C Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|---|----------|----------|
| 1 | 59107 DX | Hood sheet | 1 | 50.000 |
| ... | Q 1802 | Cap screw, 3/8 x 1" N.C. | 8 | .052 |
| ... | ..... | Slotted flat head bolt, 3/8 x 1-1/4" N.C. | 2 | ..... |
| ... | ..... | Slotted flat head bolt, 3/8 x 1-3/8" N.C. | 2 | ..... |
| ... | Q 1906 | Hex. nut, 3/8" N.C. | 4 | .031 |
| ... | Q 1920 | Lock washer, 3/8" | 12 | .005 |
| ... | ..... | Washer, 13/32" I.D. x 7/8" O.D. x 16 ga. | 8 | ..... |
| 2 | 58378 D | Side sheet, left hand. | 1 | 20.750 |
| ... | Q 1800 | Cap screw, 3/8" x 3/4" N.C. | 6 | .045 |
| ... | Q 1920 | Lock washer, 3/8" | 6 | .005 |
| 3 | 42594 D | Side sheet, right hand. | 1 | 21.250 |
| ... | Q 1800 | Cap screw, 3/8 x 3/4" N.C. | 6 | .045 |
| ... | Q 1920 | Lock washer, 3/8" | 6 | .005 |

When ordering, always use I H C Part Nos.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

TOOLS

| I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------------|--|-------------|-------------|
| 9534 D | Open end wrench, 2-11/16" (optional with 2584 T) | 1 | 7.000 |
| 11858 DA | Water pump wrench. | 1 | .125 |
| 19289 D | Hexagon socket wrench, 9/16" | 1 | .250 |
| 19291 D | Hexagon socket wrench, 5/8" | 1 | .312 |
| 19292 D | Hexagon socket wrench, 3/4" | 1 | .250 |
| 19323 D | Socket wrench handle (combination offset and tee). | 1 | 1.375 |
| 19324 D | Hexagon socket wrench, 7/8" | 1 | .218 |
| 19325 D | Hexagon socket wrench, 13/16" | 1 | .187 |
| 19326 D | Hexagon socket wrench, 1" | 1 | .250 |
| 19327 D | Hexagon socket wrench, 1-1/8" | 1 | .375 |
| 19328 D | Socket wrench set carrying case. | 1 | .906 |
| 19329 D | Socket wrench set, complete (in carrying case). | 1 | 4.093 |
| 20156 D | Square drain plug socket wrench, 1/2" | 1 | .125 |
| 20157 D | Square drain plug socket wrench, 11/16" | 1 | .171 |
| 25462 DA | Stem handled socket wrench, 1-1/32" | 1 | 1.750 |
| 25463 D | Stem handled socket wrench handle. | 1 | 2.750 |
| 25466 D | Spark plug wrench handle | 1 | .500 |
| 32941 D | Spark plug wrench, 31/32" | 1 | .250 |
| 42633 DA | Tool box assembly. | 1 | 10.562 |
| 45578 DA | Breaker point and spark plug gage bolt wrench. | 1 | .005 |
| 50092 D | Steering clutch pilot bearing retainer | 1 | .125 |
| 60012 D | Bucket lubricator with hose, complete (Lincoln No. A-1218-LH) (see detail list on pages 4 and 5) | 1 | 24.250 |
| 1326 E | End wrench, 3/4" - 7/8" | 1 | .562 |
| H 156 | Oil can. | 1 | .250 |
| Q 3794 | Hand lubricator (9 oz.) (Lincoln No. 1020) (see detail list on page 7) | 1 | 2.250 |
| 2583 T | Hammer (1-1/2 lb.) | 1 | 1.812 |
| 2587 T | Combination slip joint pliers, 8" | 1 | .562 |
| 2588 T | Screw driver, 5" (wood handle) | 1 | .312 |
| 58920 DAX | Steering clutch compressor angle tool. | 1 | 1.250 |
| Q 1870 | Cap screw, 5/8" N.C. x 1-1/2" | 2 | .216 |
| Q 1858 | Cap screw, 1/2" N.C. x 2-1/4" | 2 | .281 |
| 2584 T | Monkey wrench, 21" (optional with 9534 D). | 1 | |

GASKET PACKAGES

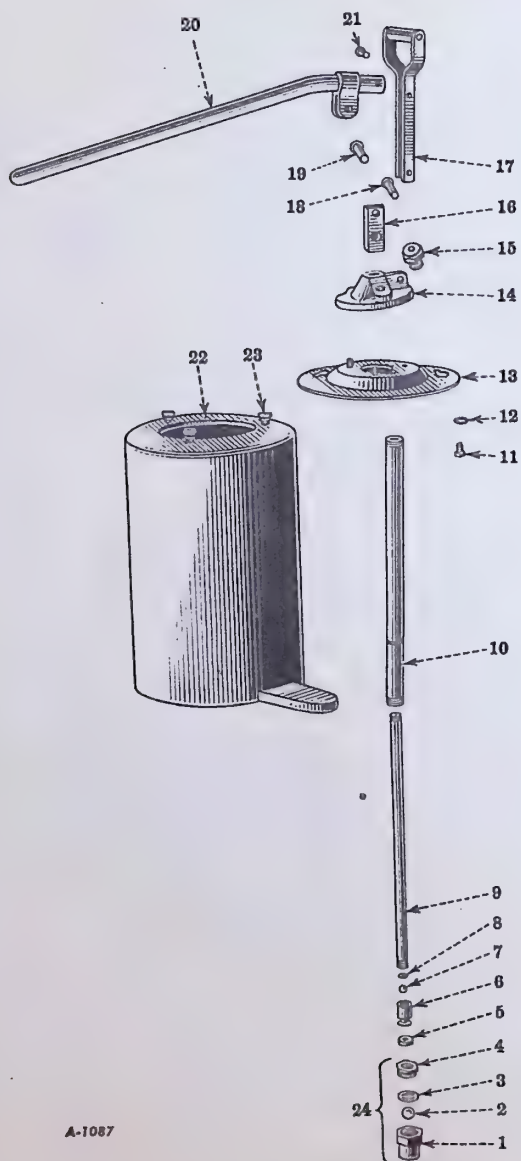
| I H C Part No. | Description | No. Used | Wt. Lbs. |
|-------------------|--|-------------|-------------|
| 68085 D | Chassis gasket package, complete | 1 | 3.750 |
| 52726 DA | Engine gasket package, complete. | 1 | 3.687 |

When ordering, always use, I H C Part Nos.

Don't order parts from the illustrations only; refer to the list also.

SPARE PARTS CATALOG

LINCOLN BUCKET LUBRICATOR



A-1087

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

Don't order parts from the illustrations only; refer to the list also.

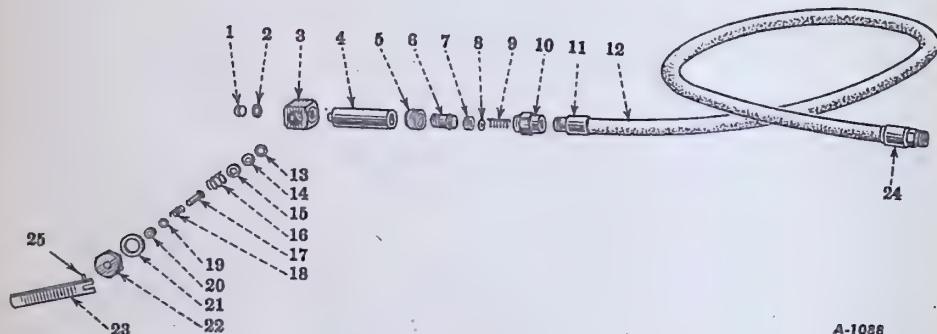
SPARE PARTS CATALOG

LINCOLN BUCKET LUBRICATOR - Continued

| Ref. No. | I H C Part No. | Lincoln Engr. Co. Part No. | Description | No. Used | Wt. Lbs. |
|-------------|-------------------|----------------------------------|---|-------------|-------------|
| ... | 60012 D | A-1218-1H | Bucket lubricator, with hose and coupler | 1 | 19.500 |
| ... | 60013 D | D-1217-1H | Bucket lubricator, less hose and coupler | 1 | 22.250 |
| ... | 62352 D | 81368 | Pump assembly. | 1 | 9.000 |
| 1 | 61733 D | 11128 | Foot valve body. | 1 | .187 |
| 2 | 62574 D | 66144 | Foot valve check ball. | 1 | .015 |
| 3 | 62573 D | 45-608 | Foot valve disc. | 1 | .006 |
| 4 | 61732 D | 11127 | Foot valve collar. | 1 | .062 |
| 5 | 40630 D | A-35-020 | Packing. | 1 | .003 |
| 6 | 40652 D | A-11-550 | Piston | 1 | .062 |
| 7 | 40719 D | A-66-002 | Ball | 1 | .006 |
| 8 | 40698 D | A-45-559 | Piston disc. | 1 | ..... |
| 9 | 61738 D | A-62111 | Pump plunger rod | 1 | .750 |
| 10 | 61737 D | A-61229 | Pump tube. | 1 | .750 |
| 11 | ..... | 50037 | Cap screw, 1/4" N.C. x 7/16" | 3 | ..... |
| 12 | 52745 V | 66170 | Cover plate washer | 3 | .001 |
| 13 | 62159 D | A-45-620 | Cover. | 1 | 1.500 |
| 14 | 61740 D | B-40-227 | Pump casting | 1 | 1.500 |
| 15 | 37290 D | A-5750 | Button head fitting. | 1 | .125 |
| 16 | 40655 D | A-11-557 | Pump outlet. | 1 | .281 |
| 17 | 53189 D | A-64-280 | Handle | 1 | .875 |
| 18 | 40638 D | A-10-472 | Toggle pin | 2 | .020 |
| 19 | 40638 D | A-10-472 | Toggle pin | 2 | .020 |
| 20 | 53193 D | 90-271 | Lever handle | 1 | 3.000 |
| 21 | 61735 D | 11283 | Toggle pin | 1 | .062 |
| 22 | 61736 D | A-60041 | Container. | 1 | 9.750 |
| 23 | 55479 D | A-11-225 | Cover screw. | 3 | .062 |
| 24 | 61739 D | A-81207 | Foot valve | 1 | .500 |

SPARE PARTS CATALOG

HOSE ASSEMBLY COUPLER FOR BUCKET LUBRICATOR

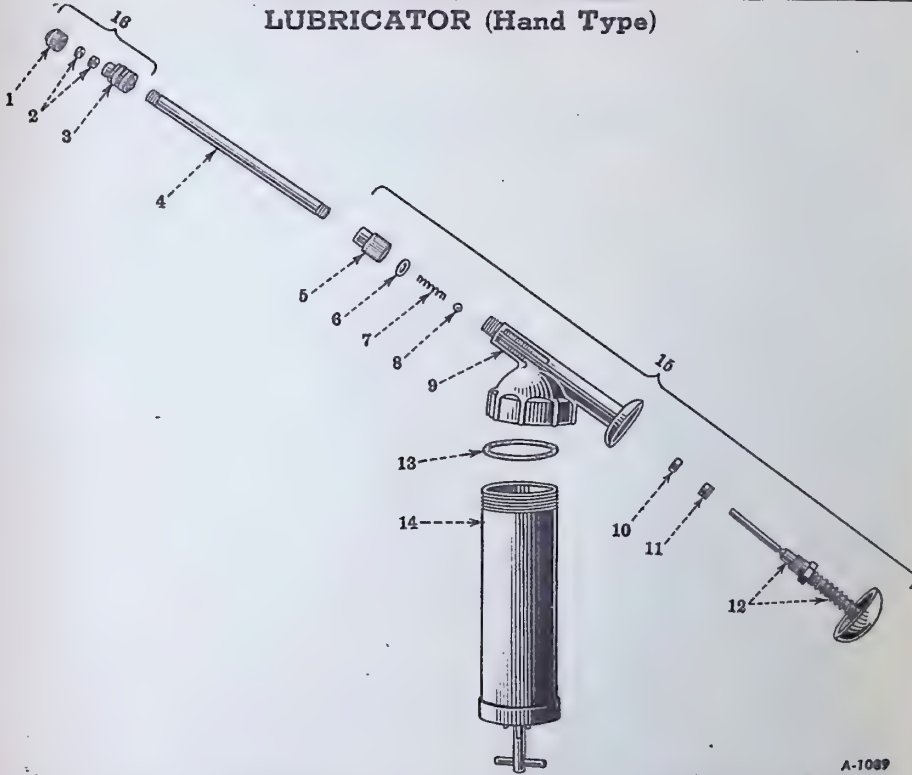


A-1088

| Ref. No. | I H C Part No. | Lincoln Engr. Co. Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|----------------------------|---------------------------------|----------|----------|
| ... | 36947 D | A-80-353 | Swivel. | 1 | .250 |
| ... | 40728 DA | A-81-219-IH | Giant coupler | 1 | .625 |
| ... | 53192 D | A-81-220 | Hose assembly with coupler. . . | 1 | 3.000 |
| 1 | 40649 D | A-10-618 | Nozzle body plug. | 1 | .010 |
| 2 | 40657 D | A-31-016 | Gasket. | 1 | .000 |
| 3 | 40648 D | A-10-617 | Giant nozzle body | 1 | .312 |
| 4 | 53187 D | A-11-137 | Coupler adapter | 1 | .375 |
| 5 | 40642 D | A-10-534 | Swivel collar | 1 | .031 |
| 6 | 40641 D | A-10-533 | Swivel stud | 1 | .093 |
| 7 | 40631 D | A-36-019 | Cup leather | 1 | .001 |
| 8 | 40703 D | A-48-080 | Swivel washer | 1 | .000 |
| 9 | 40713 D | A-56-014 | Spring. | 1 | .001 |
| 10 | 40646 D | A-10-541 | Swivel body | 1 | .125 |
| 11 | 40725 D | A-80-356 | Hose fitting. | 1 | .156 |
| 12 | 36946 D | A-79-060 | Hose (5 ft.). | 1 | 1.062 |
| 13 | 40693 D | A-45-033 | Washer. | 1 | .001 |
| 14 | 40661 D | A-34-037 | Giant packing | 1 | .003 |
| 15 | 40636 D | A-10-450 | Check seat. | 1 | .005 |
| 16 | 40712 D | A-55-067 | Spring. | 1 | .001 |
| 17 | 40644 D | A-10-537 | Plunger | 1 | .015 |
| 18 | 40711 D | A-55-063 | Plunger spring. | 1 | .001 |
| 19 | 40700 D | A-48-077 | Packing washer. | 1 | .001 |
| 20 | 40628 D | A-34-039 | Packing | 1 | .000 |
| 21 | 40656 D | A-30-012 | Gasket. | 1 | .001 |
| 22 | 40640 D | A-10-528 | Packing gland | 1 | .125 |
| 23 | 53196 D | A-11-138 | Handle. | 1 | .125 |
| 24 | 40725 D | A-80-356 | Hose fitting. | 1 | .156 |
| 25 | 40647 D | A-10-551 | Pin | 1 | .000 |

SPARE PARTS CATALOG

LUBRICATOR (Hand Type)



A-1089

Unnumbered parts in the illustrations are the same as corresponding parts shown with numbers.

| Ref. No. | I H C Part No. | Lincoln Engr. Co. Part No. | Description | No. Used | Wt. Lbs. |
|----------|----------------|----------------------------|---|----------|----------|
| ... | Q 3794 | No. 1020 | Lubricator, complete (9 oz. capacity) | 1 | 2.25 |
| 1 | 39653 D | A-10-733 | Nozzle cap | 1 | .015 |
| 2 | 39656 DX | A-34-050 | Washer (set of 2) | 1 | .010 |
| 3 | 39652 D | A-10-539 | Nozzle body | 1 | .020 |
| 4 | ..... | A-67-020 | Standard pipe, 6" | 1 | ..... |
| 5 | 39875 DX | A-10-453 | Adapter with gasket | 1 | .031 |
| 6 | 39655 D | A-33-018 | Gasket | 1 | .000 |
| 7 | 39870 D | A-55-046 | Check spring | 1 | .000 |
| 8 | 39659 D | A-66-011 | Check ball | 1 | .002 |
| 9 | 39868 D | A-41-052 | Pump body | 1 | .531 |
| 10 | 39665 D | A-34-034 | Packing | 1 | .000 |
| 11 | 39651 D | A-10-492 | Packing screw | 1 | .006 |
| 12 | 39663 D | 89-975 | Plunger assembly | 1 | .218 |
| 13 | 39654 D | A-32-029 | Gasket | 1 | .001 |
| 14 | 39661 D | B-81-903 | Tube assembly | 1 | 1.250 |
| 15 | 39662 D | 89-974 | Head assembly | 1 | .750 |
| 16 | 39800 D | A-5804-1 | Nozzle, complete | 1 | .046 |

SPARE PARTS CATALOG

LUBRICATION GUIDE KIT

(For Tractors used by the Corps of Engineers only)

| I H C Part No. | Description | No. Used |
|-------------------|---|-------------|
| 11236 GT | Kit holder bracket, front. | 1 |
| 11237 GT | Kit holder bracket, rear | 1 |
| ..... | Round head machine screw, 1/4" N.F. x 5/8" | 6 |
| ..... | Hex. nut, 1/4 " N.F. | 6 |
| ..... | Lock washer, 1/4". | 6 |
| ..... | Plain washer, 9/32" I.D. x 5/8" O.D. x 16 gage | 6 |
| ..... | *Lubrication guide kit (consists of the following parts:) | 1 |
| ..... | Metal bound lubrication guide. | 1 |
| ..... | Lubrication check cards. | 10 |
| ..... | Water proof canvas holder. | 1 |

* Furnished by the Corps of Engineers.

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|-------------|---------|------|--------|-----------|---------|------|---------|----------|---------|------|--------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| C | | | | | | | | | | | |
| 1266 C | 2 | 2 | \$1.00 | 5864 DDX | 7 | 3 | \$51.70 | 8742 DX | 12 | 2 | \$8.55 |
| D | | | | 5865 DA | 7 | 3 | 19.80 | 8743 DX | 12 | 2 | 8.55 |
| 1242 DB | 4 | 3 | .07 | 5866 DBX | 7 | 3 | 44.00 | 8820 DX | 11 | 1 | 3.70 |
| 2546 DBYB | 3 | 4 | 13.75 | 5867 DBX | 7 | 3 | 44.00 | 8829 D | 4 | 1 | 3.30 |
| 2547 DX | 3 | 4 | 2.45 | 5869 DBX | 13 | 4 | 23.65 | 8830 D | 4 | 1 | 1.25 |
| 2548 DAY | 3 | 1 | 5.25 | 5870 DBX | 13 | 4 | 23.65 | 8831 DAX | 11 | 4 | 2.05 |
| 2551 DAY6 | 3 | 3 | 1.35 | 5873 D | 13 | 4 | 6.00 | 8832 D | 4 | 1 | |
| 3202 DCRX | 4 | 12 | 13.00 | 5874 D | 13 | 4 | 60.50 | 8832 D | 11 | 6 | 10.75 |
| 3713 DA | 4 | 3 | .30 | 5875 DBX | 13 | 4 | 9.35 | 8929 D | 4 | 4 | .55 |
| 3930 DX | 3 | 1 | .70 | 5876 DA | 6 | 4 | 5.00 | 8941 DX | 7 | 7 | 10.90 |
| 4222 D | 4 | 12 | .20 | 5897 DA | 7 | 8 | 11.00 | 8942 DX | 7 | 7 | 10.90 |
| 4296 DA | 7 | 1 | 2.85 | 5900 DX | 7 | 1 | 467.50 | 9015 DAX | 11 | 4 | 2.10 |
| 4596 D | 14 | 2 | .12 | 5913 D | 2 | 4 | .50 | 9118 DX | 8 | 7 | 1.10 |
| 4710 D | 8 | 9 | .028 | 5938 DAX | 14 | 1 | 1.90 | 9323 DX | 4 | 11 | 11.50 |
| 4988 D | 4 | 8 | 3.00 | 5940 DA | 2 | 4 | 24.75 | 9323 DY | 4 | 11 | 14.25 |
| 4993 DA | 4 | 11 | 1.50 | 5941 DB | 2 | 5 | 38.50 | 9456 DX | 14 | 1 | 18.20 |
| 4994 DAX | 4 | 13 | 1.75 | 5942 D | 2 | 5 | .55 | 9457 D | 14 | 3 | 2.75 |
| 5005 DAX | 8 | 9 | 10.45 | 5944 DA | 2 | 5 | 6.60 | 9468 DX | 6 | 3 | 4.60 |
| 5006 DAX | 8 | 9 | 1.60 | 5945 DA | 2 | 5 | 6.60 | 9469 DX | 6 | 2 | 3.30 |
| 5008 DCX | 2 | 1 | 1.90 | 5947 DX | 3 | 6 | 11.40 | 9471 DX | 6 | 3 | 52.25 |
| 5009 DX | 2 | 1 | 2.55 | 5950 DX | 2 | 1 | 11.55 | 9473 DX | 6 | 3 | 76.45 |
| 5010 DAX | 2 | 1 | 6.60 | 5951 D | 2 | 3 | 2.30 | 9534 D | 15 | 3 | 3.00 |
| 5020 DB | 4 | 7 | 8.25 | 5952 D | 2 | 3 | 3.55 | 9561 DX | 4 | 17 | 15.00 |
| 5024 DAR | 11 | 3 | .75 | 5953 DX | 4 | 17 | 11.00 | 9635 DA | 11 | 4 | 2.10 |
| 5025 DBR | 4 | 8 | 1.10 | 5954 DX | 4 | 17 | 1.00 | 9637 D | 14 | 1 | .20 |
| 5027 DB | 4 | 7 | 1.70 | 5957 DAX | 4 | 11 | | 9638 DX | 14 | 1 | 1.90 |
| 5028 D | 4 | 7 | 1.70 | 5957 DAY | 4 | 11 | 18.75 | 9641 DAX | 12 | 5 | 3.85 |
| 5029 DX | 4 | 7 | 3.20 | 5958 DAX | 4 | 11 | 88.00 | 9642 DAX | 12 | 5 | 3.85 |
| 5046 DBX | 4 | 17 | 4.75 | 5960 D | 4 | 8 | .85 | 9647 DAX | 11 | 4 | 2.05 |
| 5049 DAX-32 | 8 | 6 | 5.25 | 5967 DAXA | 4 | 8 | 64.45 | 9649 DA | 5 | 4 | 3.55 |
| 5051 DX | 3 | 5 | .95 | 5967 DAYA | 4 | 8 | 91.25 | 9717 D | 12 | 3 | 18.35 |
| 5086 DX | 12 | 3 | 7.60 | 5968 DAXA | 4 | 7 | 64.45 | 10429 D | 2 | 4 | .10 |
| 5711 DB | 12 | 3 | 15.40 | 5968 DAYA | 4 | 7 | 91.25 | 10481 D | 3 | 6 | .02 |
| 5712 DB | 12 | 3 | 32.45 | 5970 DX | 4 | 7 | 13.20 | 10482 D | 3 | 6 | .02 |
| 5714 DD | 12 | 3 | 5.75 | 5972 DX | 11 | 3 | 4.15 | 10553 D | 3 | 6 | .03 |
| 5715 D | 12 | 3 | 3.30 | 5973 D | 4 | 7 | 1.50 | 10701 DA | 8 | 9 | 1.85 |
| 5723 DB | 5 | 3 | 12.65 | 5975 DX | 8 | 6 | 1.35 | 10722 D | 6 | 2 | .09 |
| 5725 DBX | 13 | 3 | 1.55 | 5976 DX | 4 | 3 | 16.75 | 10951 D | 4 | 7 | .25 |
| 5726 D | 13 | 3 | 6.00 | 5977 D | 4 | 5 | .45 | 10961 D | 4 | 15 | .12 |
| 5727 DA | 6 | 4 | 21.45 | 5980 D | 4 | 5 | 15.65 | 11373 D | 14 | 3 | .12 |
| 5728 DA | 6 | 4 | 11.00 | 5981 DX | 4 | 15 | 12.30 | 11858 DA | 15 | 3 | .85 |
| 5729 DAX | 6 | 4 | 4.40 | 5982 DAX | 4 | 15 | 3.30 | 12740 D | 3 | 6 | .05 |
| 5735 D | 13 | 2 | 24.20 | 5983 D | 4 | 15 | 2.20 | 13000 D | 4 | 8 | .05 |
| 5769 DAX | 7 | 5 | 46.20 | 5984 DX | 4 | 15 | 2.75 | 13021 D | 4 | 15 | .01 |
| 5770 DAX | 7 | 7 | 46.20 | 5986 D | 8 | 8 | 1.75 | 13055 D | 4 | 8 | .033 |
| 5773 DAX | 7 | 7 | 37.40 | 5987 DX | 2 | 2 | 6.85 | 13062 D | 4 | 4 | .05 |
| 5775 DA | 7 | 7 | .95 | 5988 D | 2 | 2 | .50 | 13083 D | 4 | 7 | .022 |
| 5776 DA | 7 | 7 | 4.40 | 5989 D | 2 | 2 | 3.45 | 13083 D | 4 | 8 | |
| 5777 D | 7 | 7 | 5.50 | 5990 DAX | 4 | 9 | 12.35 | 13085 D | 2 | 2 | .009 |
| 5801 DX | 12 | 7 | .40 | 5992 D | 3 | 7 | .65 | 13085 D | 3 | 6 | |
| 5803 DA | 7 | 1 | 3.55 | 6442 D | 2 | 5 | .45 | 13090 D | 4 | 17 | .033 |
| 5812 D | 12 | 7 | .95 | 6516 D | 4 | 13 | 1.60 | 13115 D | 14 | 1 | .022 |
| 5813 DA | 12 | 7 | 3.00 | 6517 DX | 4 | 13 | 21.45 | 13194 D | 8 | 7 | .15 |
| 5815 D | 12 | 7 | 3.00 | 6517 DX | 9 | 1 | 1.60 | 13722 D | 14 | 2 | .03 |
| 5816 DB | 12 | 7 | .65 | 6542 DEX | 4 | 3 | 21.45 | 13839 D | 4 | 9 | .05 |
| 5817 DB | 12 | 7 | 21.15 | 6649 D | 11 | 1 | .45 | 13841 D | 4 | 9 | |
| 5818 D | 12 | 7 | 16.75 | 6666 DA | 6 | 4 | 68.75 | 13897 D | 4 | 4 | .004 |
| 5830 DB | 7 | 9 | 3.55 | 8221 DA | 8 | 7 | .55 | 14561 D | 8 | 5 | .007 |
| 5831 DAX | 5 | 9 | 4.40 | 8334 D | 14 | 2 | .90 | 14971 D | 8 | 5 | .05 |
| 5832 DAX | 7 | 4 | 10.75 | 8369 DA | 14 | 2 | 3.30 | 15944 D | 13 | 4 | .05 |
| 5833 D | 6 | 3 | 6.50 | 8525 DA | 11 | 1 | 3.85 | 16445 D | 1 | 1 | .02 |
| 5834 D | 6 | 4 | 2.90 | 8530 D | 6 | 1 | 22.00 | 16445 D | 8 | 3 | |
| 5837 DBX | 14 | 3 | 2.45 | 8531 D | 6 | 1 | 3.85 | 17053 D | 14 | 1 | .50 |
| 5839 DA | 14 | 3 | 1.10 | 8532 D | 6 | 1 | 3.85 | 17564 D | 8 | 7 | .22 |
| 5841 DX | 14 | 1 | 2.75 | 8617 DX | 11 | 1 | 1.35 | 17565 DA | 8 | 7 | .12 |
| 5842 DA | 14 | 3 | .45 | 8679 DA | 12 | 5 | 1.55 | 17700 D | 14 | 1 | .17 |
| 5843 DA | 14 | 3 | 51.70 | 8680 DX | 12 | 1 | .85 | 17720 D | 11 | 2 | .17 |
| 5845 DA | 14 | 3 | | 8682 DX | 12 | 1 | 1.80 | 17829 DA | 13 | 3 | .35 |
| 5863 DDX | 7 | 3 | | 8683 DAX | 12 | 5 | 3.85 | 18377 D | 8 | 6 | .09 |
| | | | | 8684 DAX | 12 | 5 | 3.85 | 18501 DA | 14 | 2 | .05 |
| | | | | 8720 DA | 11 | 3 | 1.35 | 18511 D | 14 | 2 | 5.85 |
| | | | | 8721 D | 11 | 1 | 2.00 | 18539 D | 4 | 8 | .02 |

(Prices are subject to change without notice).

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|------------|---------|------|--------|------------|---------|------|---------|-----------|---------|------|---------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| 18575 DA | 7 | 1 | \$.12 | 21460 DY | 3 | 3 | \$ 4.40 | 27618 D | 3 | 7 | \$.005 |
| 18585 DA | 14 | 2 | | 21463 DAXA | 3 | 3 | .12 | 27618 D | 4 | 17 | |
| 18746 DA | 4 | 8 | .05 | 21464 DX | 3 | 4 | .60 | 27654 D | 2 | 1 | .17 |
| 18767 D | 4 | 13 | .40 | 21466 D | 3 | 4 | .05 | 27927 DA | 8 | 8 | .07 |
| 18767 D | 9 | 1 | .40 | 21468 D | 3 | 4 | .60 | 28388 DA | 3 | 6 | .55 |
| 18868 D | 7 | 8 | .01 | 21469 D | 3 | 4 | 7.25 | 28655 D | 3 | 4 | .12 |
| 18868 D | 14 | 2 | | 21572 D | 14 | 2 | .14 | 28656 DYA | 3 | 3 | 3.30 |
| 19289 D | 15 | 3 | .25 | 21969 D | 12 | 1 | .57 | 28656 DZA | 3 | 3 | 8.00 |
| 19291 D | 15 | 3 | .25 | 22716 D | 3 | 6 | .85 | 28657 DX | 3 | 3 | 4.00 |
| 19292 D | 15 | 3 | .35 | 23086 D | 8 | 9 | .07 | 28674 D | 3 | 3 | .12 |
| 19306 D | 11 | 1 | .02 | 23125 D | 8 | 3 | .05 | 28737 DX | 4 | 11 | .55 |
| 19323 D | 15 | 3 | 1.15 | 23874 D | 8 | 9 | 2.20 | 28738 D | 4 | 11 | .17 |
| 19324 D | 15 | 3 | .40 | 23977 DA | 8 | 3 | .12 | 28772 D | 4 | 9 | 3.85 |
| 19325 D | 15 | 3 | .35 | 23995 DA | 8 | 3 | .35 | 28809 D | 4 | 9 | 4.50 |
| 19326 D | 15 | 3 | .40 | 24017 D | 2 | 1 | .35 | 28813 D | 4 | 8 | .05 |
| 19327 D | 15 | 3 | .45 | 24602 DA | 3 | 5 | 3.45 | 28856 D | 3 | 3 | .12 |
| 19328 D | 15 | 3 | .45 | 24603 D | 3 | 5 | .03 | 28899 DB | 8 | 3 | 1.25 |
| 19329 D | 15 | 3 | 4.40 | 24604 D | 3 | 5 | .35 | 28940 D | 4 | 3 | .12 |
| 20156 D | 15 | 3 | .40 | 24605 D | 3 | 5 | .90 | 29501 DA | 4 | 9 | 6.00 |
| 20157 D | 15 | 3 | .45 | 24609 D | 3 | 5 | .05 | 29547 D | 14 | 1 | .12 |
| 20289 D | 2 | 1 | .85 | 24610 D | 3 | 5 | .05 | 29565 D | 4 | 4 | .07 |
| 20290 D | 2 | 1 | .90 | 24611 D | 3 | 5 | .85 | 29764 D | 3 | 6 | .02 |
| 20293 D | 2 | 1 | .17 | 24612 D | 3 | 5 | .12 | 29898 D | 1 | 1 | .06 |
| 20296 D | 2 | 1 | .95 | 24613 D | 3 | 5 | .05 | 29898 D | 8 | 9 | |
| 20300 D | 2 | 1 | .17 | 24616 DA | 3 | 4 | .03 | 29898 D | 8 | 12 | .08 |
| 20303 D | 2 | 1 | .40 | 24805 D | 8 | 7 | .022 | 29899 D | 8 | 3 | |
| 20308 D | 2 | 1 | 2.70 | 24916 D | 11 | 3 | .35 | 29899 D | 8 | 7 | .09 |
| 20308 D | 12 | 1 | | 24917 D | 11 | 3 | .05 | 29899 D | 12 | 1 | |
| 20585 D | 2 | 1 | .95 | 24943 D | 4 | 11 | .25 | 29902 DX | 8 | 6 | .35 |
| 20586 D | 2 | 1 | .12 | 24961 D | 4 | 7 | .12 | 30035 D | 3 | 1 | .17 |
| 20586 D | 11 | 1 | | 24962 D | 4 | 7 | .07 | 30036 D | 3 | 1 | .22 |
| 20586 D | 11 | 3 | .12 | 24964 D | 4 | 7 | .09 | 30037 D | 3 | 1 | .07 |
| 20683 D | 8 | 5 | .12 | 24965 DB | 4 | 7 | .30 | 30038 D | 3 | 1 | .05 |
| 20684 D | 8 | 5 | .05 | 25043 DB | 4 | 8 | 1.25 | 30114 D | 3 | 5 | .011 |
| 20841 D | 12 | 7 | .17 | 25063 DA | 4 | 3 | .05 | 30378 D | 3 | 4 | .05 |
| 20887 DA | 14 | 3 | .17 | 25076 D | 4 | 12 | .02 | 30379 D | 3 | 4 | .05 |
| 21314 DX | 3 | 4 | .85 | 25086 DA | 4 | 3 | .09 | 30397 D | 4 | 4 | .09 |
| 21318 D | 3 | 3 | .05 | 25087 D | 4 | 4 | .12 | 30422 D | 3 | 9 | .12 |
| 21319 D | 3 | 4 | .09 | 25090 DD | 4 | 8 | 1.25 | 30436 D | 3 | 9 | .22 |
| 21322 D | 3 | 3 | 4.40 | 25093 DA | 4 | 12 | .02 | 30436 D | 3 | 11 | .09 |
| 21323 D | 3 | 3 | .17 | 25115 D | 11 | 1 | .05 | 30624 D | 4 | 3 | |
| 21324 D | 3 | 3 | .05 | 25121 D | 4 | 3 | .03 | 30693 DX | 3 | 9 | .85 |
| 21327 D | 3 | 1 | .05 | 25122 D | 4 | 17 | .05 | 30693 DX | 3 | 11 | |
| 21328 DX | 3 | 3 | .17 | 25125 D | 4 | 17 | .05 | 30824 D | 2 | 1 | .03 |
| 21329 DX | 3 | 1 | .35 | 25130 D | 4 | 3 | .05 | 31121 D | 4 | 8 | .03 |
| 21330 D | 3 | 1 | .05 | 25131 D | 4 | 3 | .40 | 31135 D | 3 | 1 | .05 |
| 21331 D | 3 | 4 | .17 | 25132 D | 3 | 6 | .05 | 31439 DB | 8 | 9 | 2.05 |
| 21333 DX6 | 3 | 4 | 22.00 | 25132 D | 4 | 4 | | 31441 D | 8 | 9 | .90 |
| 21340 D | 3 | 4 | .05 | 25134 DA | 4 | 12 | 5.00 | 31458 D | 4 | 11 | .35 |
| 21342 D | 3 | 4 | .03 | 25138 DAX | 4 | 3 | 3.45 | 31536 DB | 4 | 8 | .70 |
| 21343 D | 3 | 4 | .05 | 25140 DEX | 4 | 3 | 7.90 | 31636 D | 8 | 5 | .02 |
| 21347 DC | 3 | 3 | .05 | 25323 D | 4 | 8 | .14 | 31729 D | 4 | 3 | .35 |
| 21348 DB | 3 | 3 | .05 | 25352 D | 3 | 6 | .02 | 32181 D | 2 | 5 | .03 |
| 21349 D | 3 | 4 | .09 | 25354 D | 8 | 9 | .14 | 32280 DCR | 4 | 8 | 1.65 |
| 21353 D | 3 | 4 | .05 | 25362 D | 8 | 9 | 8.80 | 32281 DBR | 4 | 8 | 1.65 |
| 21360 DX6 | 3 | 4 | 3.30 | 25462 DA | 15 | 3 | 1.15 | 32282 DCR | 4 | 8 | 1.65 |
| 21361 D | 3 | 4 | .03 | 25463 D | 15 | 3 | .75 | 32283 DBR | 4 | 8 | 1.65 |
| 21362 D | 3 | 4 | .05 | 25466 D | 15 | 3 | .40 | 32284 DB | 4 | 8 | 7.00 |
| 21366 D | 3 | 3 | .09 | 25796 DA | 3 | 3 | 2.75 | 32288 DAX | 4 | 12 | 158.00 |
| 21368 DBY6 | 3 | 1 | 1.20 | 25948 D | 8 | 6 | .05 | 32305 DAX | 4 | 12 | 158.00 |
| 21373 DBY1 | 3 | 1 | .80 | 25954 D | 4 | 4 | .05 | 32307 DB | 4 | 11 | .20 |
| 21383 D | 3 | 1 | .35 | 25989 DA | 8 | 6 | .30 | 32307 DA | 4 | 12 | .30 |
| 21384 DAX | 3 | 1 | .30 | 26916 D | 4 | 11 | .12 | 32308 D | 4 | 11 | .03 |
| 21388 DBX1 | 3 | 1 | .30 | 27140 DDX | 4 | 7 | 5.00 | 32309 D | 4 | 12 | .08 |
| 21393 D | 3 | 1 | .05 | 27141 D | 4 | 7 | .07 | 32310 DX | 4 | 12 | 2.10 |
| 21394 D | 3 | 1 | .05 | 27311 D | 3 | 5 | .09 | 32311 D | 4 | 12 | .07 |
| 21397 D | 3 | 4 | .05 | 27385 D | 3 | 9 | .05 | 32312 D | 4 | 12 | .05 |
| 21399 DX | 3 | 4 | .45 | 27386 D | 3 | 8 | .05 | 32319 D | 4 | 15 | .03 |
| 21401 DAX | 3 | 4 | 6.35 | 27386 D | 3 | 9 | | 32332 D | 4 | 12 | .35 |
| 21409 DB | 3 | 2 | .85 | 27387 D | 3 | 7 | .05 | 32333 D | 4 | 12 | .12 |
| 21422 D | 3 | 2 | .05 | 27435 D | 8 | 5 | .50 | 32340 D | 8 | 9 | .12 |
| 21441 D | 3 | 2 | .05 | 27436 D | 8 | 6 | .05 | 32341 D | 8 | 9 | .05 |
| 21443 DX | 3 | 3 | .12 | 27445 DB | 8 | 6 | .03 | 32342 D | 8 | 9 | .03 |
| 21444 D | 3 | 3 | .03 | 27452 D | 8 | 5 | .40 | 32343 D | 8 | 9 | .17 |

(Prices are subject to change without notice).

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|------------|---------|------|---------|-----------|---------|------|--------|------------|---------|------|--------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| 32345 D | 8 | 9 | \$10.10 | 32603 DAX | 3 | 5 | \$2.20 | 39651 D | 15 | 7 | \$.15 |
| 32346 DAX | 8 | 9 | 5.40 | 32604 D | 8 | 6 | .05 | 39652 D | 15 | 7 | .20 |
| 32347 D | 8 | 9 | .05 | 32606 DA | 8 | 6 | .05 | 39653 D | 15 | 7 | .25 |
| 32349 D | 2 | 1 | .03 | 32607 DA | 8 | 5 | .03 | 39654 D | 15 | 7 | .10 |
| 32350 D | 2 | 1 | .30 | 32608 D | 8 | 5 | .12 | 39655 D | 15 | 7 | .03 |
| 32351 D | 2 | 1 | .08 | 32609 D | 8 | 5 | .12 | 39656 DX | 15 | 7 | .20 |
| 32352 D | 2 | 1 | .12 | 32610 D | 8 | 5 | .03 | 39659 D | 15 | 7 | .03 |
| 32353 D | 2 | 1 | 6.00 | 32614 DX | 8 | 6 | .12 | 39661 D | 15 | 7 | 1.70 |
| 32354 D | 2 | 1 | 5.40 | 32615 D | 8 | 6 | .03 | 39662 D | 15 | 7 | 2.25 |
| 32356 D | 2 | 1 | .50 | 32616 D | 8 | 6 | .45 | 39663 D | 15 | 7 | .75 |
| 32357 D | 2 | 1 | 3.45 | 32624 D | 2 | 1 | .05 | 39665 D | 15 | 7 | .08 |
| 32360 D | 4 | 17 | .15 | 32671 D | 3 | 5 | .90 | 39677 D | 4 | 9 | .25 |
| 32361 D | 3 | 1 | 60.00 | 32673 D | 3 | 1 | .03 | 39749 DA | 3 | 7 | .17 |
| 32362 D | 8 | 9 | .05 | 32711 D | 3 | 5 | .12 | 39756 D | 4 | 3 | .35 |
| 32366 D | 4 | 17 | .35 | 32712 D | 3 | 5 | 2.55 | 39757 D | 4 | 3 | .20 |
| 32367 DAX | 4 | 3 | 13.00 | 32713 DA | 4 | 8 | .65 | 39761 D | 4 | 4 | .12 |
| 32368 DA | 4 | 3 | .20 | 32895 D | 8 | 5 | .30 | 39762 D | 4 | 4 | .05 |
| 32370 D | 4 | 4 | .09 | 32896 D | 8 | 5 | .05 | 39763 D | 4 | 4 | .05 |
| 32371 D | 4 | 4 | .35 | 32897 D | 8 | 5 | .03 | 39764 D | 4 | 3 | .03 |
| 32444 D | 4 | 8 | .07 | 32941 D | 15 | 3 | .45 | 39800 D | 15 | 7 | .50 |
| 32445 D | 4 | 8 | .05 | 32942 D | 4 | 11 | .60 | 39810 D | 4 | 3 | .45 |
| 32447 DA | 4 | 7 | .25 | 32948 D | 8 | 5 | .35 | 39868 D | 15 | 7 | 1.20 |
| 32448 D | 4 | 8 | .25 | 32948 DX | 8 | 5 | .50 | 39870 D | 15 | 7 | .05 |
| 32454 D | 4 | 8 | .14 | 33138 D | 3 | 4 | .85 | 39875 DX | 15 | 7 | .17 |
| 32455 D | 4 | 8 | .05 | 33150 D | 3 | 5 | .50 | 40142 D | 4 | 18 | 2.45 |
| 32457 D | 4 | 7 | .40 | 33275 D | 8 | 9 | 8.55 | 40216 D | 8 | 11 | .05 |
| 32458 D | 4 | 7 | .60 | 33788 D | 3 | 6 | 1.00 | 40255 D | 8 | 11 | .25 |
| 32459 D | 4 | 7 | .03 | 33814 D | 2 | 3 | 2.75 | 40329 DA | 8 | 12 | .01 |
| 32460 D | 11 | 3 | .70 | 35089 DA | 7 | 5 | .05 | 40385 D | 8 | 13 | .45 |
| 32462 D | 4 | 7 | 1.15 | 35252 DX | 12 | 1 | .25 | 40386 D | 8 | 13 | 1.90 |
| 32463 D | 4 | 7 | .12 | 35319 D | 12 | 1 | .25 | 40388 D | 8 | 13 | .25 |
| 32464 DA | 4 | 7 | 4.40 | 35591 DX | 3 | 6 | .55 | 40390 D | 8 | 13 | .4 |
| 32465 D | 4 | 7 | .17 | 35719 D | 8 | 6 | 7.00 | 40395 D | 8 | 13 | .2 |
| 32466 DX | 4 | 7 | 2.05 | 36092 D | 3 | 6 | .45 | 40397 D | 8 | 13 | .9 |
| 32467 DX | 4 | 7 | 2.05 | 36246 D | 4 | 17 | .07 | 40399 DA | 8 | 11 | .2 |
| 32468 DX | 4 | 7 | 2.05 | 36273 D | 3 | 5 | 6.35 | 40401 D | 8 | 11 | .11 |
| 32469 DX | 11 | 3 | 4.25 | 36794 D | 3 | 12 | .20 | 40465 DX | 14 | 1 | .17 |
| 32470 DX | 11 | 3 | 4.95 | 36794 D | 4 | 13 | 8.80 | 40466 DX | 14 | 1 | .17 |
| 32471 DA | 11 | 3 | 3.45 | 36795 DA | 9 | 1 | 8.80 | 40628 D | 15 | 6 | .15 |
| 32479 D | 11 | 3 | .17 | 36795 DA | 4 | 13 | .05 | 40630 D | 15 | 5 | .35 |
| 32482 DB | 4 | 8 | 2.90 | 36796 DA | 9 | 1 | .05 | 40631 D | 15 | 6 | .15 |
| 32485 D | 4 | 8 | .06 | 36797 D | 4 | 4 | .17 | 40636 D | 15 | 6 | .20 |
| 32486 DAX | 4 | 8 | 1.60 | 36798 D | 4 | 4 | .40 | 40638 D | 15 | 5 | .15 |
| 32493 D | 8 | 9 | .30 | 36799 D | 4 | 4 | .17 | 40640 D | 15 | 6 | .45 |
| 32495 D | 4 | 17 | .20 | 36946 D | 4 | 4 | .12 | 40641 D | 15 | 6 | .45 |
| 32497 DX | 3 | 6 | 4.40 | 36947 D | 15 | 6 | 6.50 | 40642 D | 15 | 6 | .20 |
| 32498 DAX | 3 | 6 | 3.80 | 37148 D | 15 | 6 | 1.25 | 40644 D | 15 | 6 | .35 |
| 32500 DA | 3 | 6 | 3.85 | 37150 D | 8 | 9 | .05 | 40646 D | 15 | 6 | .45 |
| 32501 D | 3 | 6 | 3.45 | 37152 D | 8 | 9 | .70 | 40847 D | 15 | 6 | .05 |
| 32502 D | 3 | 6 | .07 | 37165 D | 8 | 9 | 6.60 | 40648 D | 15 | 6 | 3.00 |
| 32503 D | 3 | 6 | .60 | 37290 D | 8 | 3 | .17 | 40649 D | 15 | 6 | .10 |
| 32504 D | 3 | 6 | .05 | 37290 D | 13 | 3 | .32 | 40652 D | 15 | 5 | .40 |
| 32505 D | 3 | 6 | .08 | 37291 D | 13 | 4 | .32 | 40655 D | 15 | 5 | 1.00 |
| 32506 D | 3 | 6 | .30 | 37292 D | 15 | 5 | .32 | 40656 D | 15 | 6 | .05 |
| 32523 D | 2 | 2 | .45 | 37293 D | 3 | 7 | .015 | 40657 D | 15 | 6 | .03 |
| 32572 DAX | 8 | 6 | .85 | 37323 DX | 13 | 2 | .10 | 40661 D | 15 | 6 | .25 |
| 32574 D | 8 | 6 | .05 | 37634 D | 8 | 3 | .30 | 40693 D | 15 | 6 | .05 |
| 32575 D | 8 | 6 | .35 | 37976 D | 2 | 3 | 2.75 | 40698 D | 15 | 5 | .05 |
| 32576 DX | 8 | 6 | .17 | 38026 DMX | 3 | 13 | .12 | 40700 D | 15 | 6 | .05 |
| 32577 D | 8 | 6 | .12 | 38028 DM | 8 | 3 | .35 | 40703 D | 15 | 6 | .03 |
| 32578 D | 8 | 6 | .12 | 38041 D | 4 | 4 | .05 | 40711 D | 15 | 6 | .05 |
| 32581 DAX | 8 | 6 | .75 | 38100 D | 3 | 4 | .05 | 40712 D | 15 | 6 | .05 |
| 32582 D | 8 | 5 | .05 | 38101 D | 3 | 9 | .05 | 40713 D | 15 | 6 | .05 |
| 32585 DA | 8 | 5 | .30 | 38411 D | 3 | 10 | .05 | 40719 D | 15 | 5 | .03 |
| 32586 D | 8 | 6 | .05 | 38433 D | 3 | 9 | .03 | 40725 D | 15 | 6 | .75 |
| 32587 D | 8 | 5 | .03 | 38609 DA | 3 | 10 | .03 | 40728 DA | 15 | 6 | 5.00 |
| 32588 D | 8 | 5 | .03 | 38614 DX | 4 | 17 | .03 | 40875 DAXA | 4 | 4 | 5.25 |
| 32589 DX | 8 | 5 | .60 | 39019 D | 3 | 4 | .014 | 40877 DB | 12 | 3 | 12.90 |
| 32590 D | 8 | 5 | .05 | 39360 D | 4 | 3 | 3.45 | 40880 D | 12 | 2 | 2.35 |
| 32592 D | 8 | 5 | .05 | 39401 D | 3 | 8 | .12 | 40882 D | 12 | 3 | 1.65 |
| 32597 D | 8 | 6 | .05 | 39422 D | 4 | 4 | .09 | 40883 DB | 12 | 3 | 3.30 |
| 32599 D | 8 | 5 | .03 | 39423 D | 4 | 12 | 6.00 | 40888 D | 14 | 2 | .22 |
| 32600 D | 8 | 5 | .05 | 39577 DA | 4 | 12 | .03 | 40890 D | 12 | 2 | 13.00 |
| 32601 D | 8 | 5 | .12 | | 4 | 12 | .17 | 40891 DD | 12 | 2 | 141.00 |
| 32602 DAX7 | 8 | 5 | 1.25 | | 4 | 9 | 1.35 | 40929 D | 12 | 2 | .17 |

(Prices are subject to change without notice)

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|-----------|---------|------|--------|-----------|---------|------|--------|-----------|---------|------|--------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| 40930 D | 6 | 1 | \$.85 | 41517 D | 12 | 7 | \$1.35 | 41842 D | 6 | 5 | \$.17 |
| 40931 D | 6 | 1 | .05 | 41519 D | 12 | 7 | .03 | 41842 D | 7 | 8 | |
| 40932 D | 7 | 1 | .14 | 41520 D | 12 | 7 | 3.00 | 41843 DA | 7 | 3 | 44.00 |
| 40938 DE | 5 | 3 | 172.00 | 41521 D | 12 | 7 | .17 | 41845 D | 7 | 3 | .50 |
| 40941 D | 5 | 3 | 9.65 | 41522 D | 12 | 7 | .17 | 41846 D | 7 | 3 | 3.30 |
| 40942 DX | 5 | 3 | 4.40 | 41523 D | 12 | 7 | .17 | 41853 DB | 7 | 3 | |
| 40943 D | 5 | 3 | 1.10 | 41524 D | 12 | 7 | 1.65 | 41853 DB | 13 | 4 | 5.50 |
| 40944 DB | 5 | 3 | 7.70 | 41535 DX | 10 | 1 | 5.00 | 41861 D | 13 | 4 | .70 |
| 40945 D | 5 | 4 | .35 | 41536 DX | 10 | 1 | 5.00 | 41862 D | 13 | 4 | 1.30 |
| 40946 D | 5 | 3 | 4.75 | 41574 DCX | 8 | 3 | 5.50 | 41865 D | 13 | 4 | .85 |
| 40947 D | 5 | 3 | .22 | 41589 D | 7 | 9 | 1.65 | 41866 D | 13 | 4 | .12 |
| 40948 D | 5 | 3 | 3.30 | 41591 DA | 7 | 9 | 15.65 | 41867 DA | 13 | 4 | .95 |
| 40974 DA | 5 | 3 | .09 | 41592 D | 7 | 9 | .45 | 41868 D | 13 | 4 | 12.00 |
| 40976 DB | 13 | 1 | 1.90 | 41593 D | 7 | 9 | 1.65 | 41869 D | 13 | 4 | .05 |
| 40977 DB | 13 | 1 | 1.90 | 41594 D | 7 | 9 | 1.35 | 41876 DA | 6 | 4 | .35 |
| 40978 DB | 13 | 1 | 2.05 | 41595 D | 7 | 9 | 35.75 | 41877 D | 6 | 3 | 41.35 |
| 40979 D | 13 | 1 | 2.10 | 41597 D | 5 | 4 | | 41878 D | 6 | 4 | .60 |
| 40980 DB | 13 | 1 | .05 | 41597 D | 11 | 4 | | 41879 DA | 6 | 4 | 3.55 |
| 40981 D | 13 | 1 | 1.25 | 41597 D | 12 | 5 | .15 | 41881 D | 6 | 4 | 3.55 |
| 40982 DA | 13 | 1 | 1.00 | 41597 D | 14 | 1 | | 41882 D | 6 | 3 | 44.00 |
| 40986 DB | 13 | 1 | .11 | 41598 D | 7 | 1 | .30 | 41886 DX | 6 | 4 | 9.65 |
| 40987 D | 13 | 3 | 4.40 | 41599 D | 7 | 1 | .17 | 41889 D | 6 | 3 | 1.35 |
| 40988 D | 13 | 3 | .85 | 41600 D | 7 | 1 | .05 | 41890 D | 6 | 3 | 3.85 |
| 40990 D | 6 | 4 | .12 | 41604 D | 6 | 3 | 4.25 | 41893 D | 6 | 4 | .08 |
| 40991 DA | 13 | 3 | .05 | 41605 D | 6 | 3 | .65 | 41894 D | 6 | 4 | 1.90 |
| 40992 D | 13 | 2 | | 41606 D | 6 | 3 | 3.00 | 41896 DA | 13 | 5 | 5.25 |
| 40993 D | 13 | 3 | .30 | 41608 D | 6 | 4 | .05 | 41897 DA | 13 | 5 | 5.25 |
| 40997 DA | 6 | 4 | 93.50 | 41609 D | 6 | 3 | 7.50 | 41906 D | 3 | 9 | |
| 40998 DA | 6 | 5 | | 41610 D | 6 | 3 | 6.00 | 41906 D | 3 | 11 | 1.65 |
| 40998 DA | 7 | 1 | .30 | 41612 D | 6 | 4 | 3.00 | 41908 DA | 3 | 9 | |
| 40999 D | 6 | 3 | .17 | 41613 D | 6 | 4 | .55 | 41908 DA | 3 | 11 | 2.60 |
| 41162 D | 7 | 1 | .07 | 41618 D | 6 | 4 | 4.75 | 41908 DA | 3 | 13 | |
| 41400 DA | 13 | 2 | 30.25 | 41619 D | 6 | 5 | .05 | 41909 D | 3 | 9 | |
| 41402 DA | 13 | 2 | 28.25 | 41620 D | 6 | 5 | 4.40 | 41909 D | 3 | 11 | 1.20 |
| 41404 DAX | 13 | 4 | 1.25 | 41638 D | 4 | 1 | .12 | 41916 D | 3 | 10 | .17 |
| 41405 DA | 13 | 2 | .22 | 41643 D | 14 | 2 | 30.25 | 41934 DB | 1 | 1 | 1.35 |
| 41406 D | 13 | 2 | .14 | 41644 DA | 14 | 2 | 20.00 | 41935 D | 12 | 7 | .17 |
| 41408 D | 13 | 2 | .55 | 41645 DA | 14 | 3 | 33.00 | 41957 D | 7 | 1 | .09 |
| 41418 D | 12 | 7 | 27.50 | 41646 D | 14 | 3 | 13.75 | 41999 D | 12 | 7 | .09 |
| 41480 D | 7 | 5 | 3.85 | 41647 DB | 14 | 3 | 13.45 | 42000 D | 7 | 1 | .22 |
| 41481 D | 7 | 5 | .17 | 41649 DA | 14 | 2 | 23.65 | 42005 DA | 7 | 8 | 53.35 |
| 41483 DKA | 7 | 5 | 15.25 | 41651 D | 14 | 2 | 23.00 | 42006 DA | 7 | 8 | 53.35 |
| 41485 DB | 7 | 5 | 17.25 | 41653 DB | 14 | 2 | 9.00 | 42101 D | 13 | 3 | .05 |
| 41436 D | 6 | 2 | 2.05 | 41654 DX | 14 | 2 | 22.00 | 42127 D | 7 | 8 | .12 |
| 41439 D | 7 | 7 | 68.75 | 41657 D | 14 | 1 | 6.85 | 42128 D | 7 | 8 | .12 |
| 41440 D | 7 | 7 | 1.90 | 41658 D | 14 | 3 | .65 | 42129 D | 7 | 8 | .12 |
| 41441 D | 7 | 7 | .70 | 41660 D | 14 | 2 | .05 | 42130 D | 7 | 8 | .05 |
| 41442 D | 7 | 7 | .30 | 41661 D | 14 | 3 | .31 | 42131 D | 7 | 8 | .05 |
| 41443 D | 7 | 7 | 3.00 | 41662 DA | 14 | 3 | .03 | 42132 D | 7 | 8 | .05 |
| 41444 D | 7 | 7 | .45 | 41663 D | 14 | 3 | 1.35 | 42134 D | 7 | 8 | .17 |
| 41445 D | 7 | 7 | .70 | 41664 D | 14 | 1 | 1.35 | 42158 D | 2 | 4 | .25 |
| 41452 D | 7 | 7 | 20.25 | 41665 D | 14 | 1 | .12 | 42175 D | 12 | 5 | .17 |
| 41453 D | 7 | 7 | 20.25 | 41666 D | 14 | 1 | | 42216 DX | 4 | 17 | .85 |
| 41454 D | 7 | 7 | 18.00 | 41667 D | 14 | 3 | 1.10 | 42219 D | 4 | 11 | .90 |
| 41455 D | 7 | 7 | 16.00 | 41668 DA | 14 | 1 | .22 | 42239 D | 6 | 2 | 11.05 |
| 41456 D | 7 | 7 | 15.00 | 41670 D | 14 | 2 | .65 | 42288 D | 7 | 1 | 1.10 |
| 41457 D | 7 | 7 | 12.00 | 41671 D | 14 | 2 | .45 | 42289 D | 7 | 1 | .08 |
| 41458 DX | 7 | 7 | .40 | 41672 DA | 14 | 3 | 1.10 | 42290 D | 7 | 1 | .50 |
| 41464 D | 6 | 2 | 3.55 | 41677 D | 14 | 3 | .22 | 42293 D | 7 | 4 | .22 |
| 41466 DAX | 6 | 2 | 37.65 | 41678 DA | 14 | 3 | .12 | 42297 D | 7 | 1 | .35 |
| 41491 D | 12 | 7 | .17 | 41679 DA | 14 | 3 | .12 | 42298 DB | 5 | 3 | .45 |
| 41492 D | 12 | 7 | .85 | 41680 DA | 14 | 3 | .12 | 42356 DA | 4 | 9 | 2.75 |
| 41493 D | 12 | 7 | .17 | 41681 D | 14 | 2 | 6.25 | 42366 D | 4 | 9 | 1.10 |
| 41495 D | 12 | 7 | .30 | 41690 D | 14 | 1 | .65 | 42367 D | 4 | 9 | .03 |
| 41496 D | 12 | 7 | .05 | 41693 DA | 5 | 3 | .09 | 42368 D | 4 | 9 | .12 |
| 41497 D | 12 | 7 | .05 | 41694 DA | 14 | 1 | 1.10 | 42369 DA | 4 | 9 | .85 |
| 41498 D | 12 | 7 | .09 | 41745 DAX | 4 | 9 | 9.00 | 42371 DA | 4 | 9 | .09 |
| 41499 D | 12 | 7 | .30 | 41746 D | 4 | 9 | .17 | 42372 D | 4 | 9 | 3.30 |
| 41500 DA | 12 | 7 | .12 | 41747 DX | 4 | 9 | 3.75 | 42383 D | 1 | 1 | |
| 41501 D | 12 | 7 | .30 | 41768 D | 12 | 5 | .17 | 42383 D | 3 | 8 | 1.10 |
| 41508 D | 12 | 7 | .17 | 41826 DKA | 3 | 13 | 2.75 | 42383 D | 3 | 10 | |
| 41509 D | 12 | 7 | .05 | 41827 D | 3 | 13 | .05 | 42384 DAX | 8 | 3 | .75 |
| 41512 DA | 12 | 7 | .70 | 41830 D | 3 | 13 | .17 | 42385 D | 8 | 3 | .05 |
| 41514 D | 12 | 7 | .70 | 41831 D | 3 | 13 | .05 | 42387 D | 8 | 3 | .55 |
| 41515 D | 12 | 7 | .17 | 41832 DBX | 3 | 13 | 1.55 | 42400 DEX | 8 | 3 | 65.70 |

(Prices are subject to change without notice)

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|-----------|---------|------|--------|-----------|---------|------|---------|------------|---------|------|--------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| 42406 DX | 8 | 3 | \$.35 | 42707 DAX | 4 | 3 | \$18.25 | 42941 D | 2 | 2 | \$.07 |
| 42493 D | 1 | 1 | .30 | 42708 D | 4 | 3 | .12 | 42942 D | 2 | 2 | .12 |
| 42493 DX | 1 | 1 | .35 | 42709 DX | 4 | 3 | 13.20 | 42959 DA | 4 | 9 | .22 |
| 42495 D | 8 | 3 | .40 | 42713 D | 4 | 3 | .40 | 42971 DX | 13 | 4 | 2.75 |
| 42496 DX | 14 | 1 | .40 | 42714 D | 4 | 3 | .08 | 42981 DA | 11 | 1 | .40 |
| 42511 D | 14 | 1 | .10 | 42715 D | 4 | 15 | .85 | 42999 D | 3 | 9 | 80.00 |
| 42512 DAX | 14 | 1 | 3.40 | 42717 D | 4 | 3 | .40 | 42999 D | 3 | 10 | |
| 42517 D | 14 | 2 | 1.10 | 42718 DB | 4 | 3 | .22 | 43002 D | 8 | 9 | .12 |
| 42518 D | 14 | 2 | .55 | 42733 D | 4 | 4 | .12 | 43003 DX | 4 | 15 | 3.85 |
| 42534 D | 2 | 4 | .50 | 42747 D | 4 | 8 | 2.30 | 43004 DX | 4 | 15 | 3.70 |
| 42536 D | 2 | 5 | .05 | 42748 DA | 4 | 8 | .22 | 43006 D | 3 | 7 | 2.45 |
| 42538 DA | 2 | 5 | 72.50 | 42749 D | 11 | 3 | 1.70 | 43039 D | 3 | 11 | .10 |
| 42544 DA | 2 | 5 | 7.15 | 42750 D | 11 | 3 | .85 | 43040 D | 3 | 11 | .15 |
| 42545 DA | 2 | 5 | 7.15 | 42754 DA | 11 | 3 | 1.00 | 43113 D | 4 | 11 | .45 |
| 42547 D | 1 | 1 | .85 | 42755 D | 11 | 3 | .40 | 43189 D | 8 | 13 | .05 |
| 42552 D | 7 | 1 | .95 | 42756 D | 11 | 3 | .12 | 43190 DA | 5 | 3 | 40.85 |
| 42553 DXA | 1 | 1 | 8.25 | 42759 D | 11 | 3 | .17 | 43192 DA | 8 | 9 | 1.35 |
| 42589 D | 2 | 5 | .09 | 42760 D | 11 | 3 | .60 | 43193 DAX | 5 | 3 | 9.50 |
| 42594 D | 15 | 2 | 1.90 | 42762 D | 4 | 7 | .70 | 43194 D | 5 | 4 | .70 |
| 42599 D | 2 | 4 | .50 | 42763 D | 4 | 8 | 1.00 | 43195 D | 5 | 3 | .16 |
| 42600 D | 2 | 5 | .50 | 42765 DA | 8 | 9 | 3.15 | 43197 DX | 5 | 3 | 14.50 |
| 42601 DAX | 2 | 5 | .55 | 42766 D | 8 | 9 | 1.60 | 43198 D | 5 | 3 | 4.00 |
| 42603 DA | 2 | 5 | 13.00 | 42767 D | 8 | 9 | .05 | 43199 D | 5 | 4 | .10 |
| 42605 D | 2 | 5 | 1.00 | 42769 D | 8 | 6 | .10 | 43201 DA | 5 | 3 | .75 |
| 42610 D | 2 | 4 | .85 | 42771 D | 8 | 5 | 5.00 | 43202 D | 5 | 3 | 41.80 |
| 42612 D | 2 | 5 | .17 | 42772 D | 8 | 5 | .30 | 43206 DE | 5 | 4 | 134.00 |
| 42614 D | 2 | 5 | .17 | 42773 D | 8 | 5 | .22 | 43207 D | 5 | 4 | .65 |
| 42615 DE | 2 | 4 | 165.00 | 42774 D | 8 | 5 | .50 | 43208 DCX | 5 | 4 | 21.00 |
| 42622 DA | 10 | 1 | 7.45 | 42775 D | 8 | 5 | .40 | 43209 DA | 5 | 4 | .24 |
| 42623 DA | 10 | 1 | 7.45 | 42780 DX | 11 | 3 | 1.35 | 43211 D | 5 | 4 | .10 |
| 42624 D | 10 | 1 | 1.25 | 42782 D | 4 | 17 | 1.00 | 43212 DBXA | 5 | 3 | 21.50 |
| 42625 D | 10 | 1 | 1.25 | 42783 DXB | 4 | 15 | 2.75 | 43213 DBX | 5 | 4 | 26.00 |
| 42626 D | 10 | 1 | 1.25 | 42786 D | 4 | 15 | .50 | 43214 D | 5 | 3 | 7.50 |
| 42627 DX | 10 | 1 | 4.15 | 42789 D | 4 | 15 | .05 | 43217 D | 5 | 4 | .10 |
| 42628 DX | 10 | 1 | 4.15 | 42790 D | 4 | 15 | .10 | 43246 DX | 5 | 3 | 14.30 |
| 42629 DX | 10 | 1 | 1.65 | 42791 DA | 4 | 15 | 1.35 | 43248 D | 5 | 4 | .70 |
| 42630 D | 10 | 1 | .65 | 42792 D | 4 | 15 | .05 | 43368 DX | 4 | 17 | .20 |
| 42633 DA | 15 | 3 | 1.80 | 42794 D | 4 | 15 | 49.50 | 43369 DX | 4 | 17 | .35 |
| 42635 D | 10 | 1 | 27.50 | 42795 DX | 4 | 15 | 1.10 | 43370 DX | 4 | 17 | .35 |
| 42636 D | 10 | 1 | 24.75 | 42799 D | 8 | 8 | .12 | 43371 DX | 4 | 17 | .40 |
| 42654 D | 2 | 3 | .05 | 42833 D | 3 | 8 | | 43372 DX | 4 | 17 | .35 |
| 42655 D | 2 | 3 | .10 | 42833 D | 3 | 11 | 1.35 | 43664 DA | 12 | 7 | .75 |
| 42656 D | 2 | 3 | .12 | 42833 D | 3 | 13 | | 45285 DA | 4 | 15 | .30 |
| 42657 D | 4 | 17 | .70 | 42844 D | 8 | 6 | .12 | 45391 D | 11 | 1 | .03 |
| 42658 D | 4 | 17 | 1.35 | 42863 D | 8 | 5 | .85 | 45578 DA | 15 | 3 | .05 |
| 42659 D | 4 | 17 | .09 | 42867 D | 8 | 5 | .70 | 45794 D | 12 | 5 | .09 |
| 42660 DA | 4 | 17 | 3.50 | 42868 D | 8 | 5 | .17 | 45904 DB | 4 | 1 | 4.15 |
| 42661 D | 4 | 17 | .03 | 42869 D | 8 | 5 | .22 | 45976 D | 4 | 4 | .05 |
| 42662 D | 4 | 17 | .05 | 42870 D | 8 | 3 | | 45977 D | 4 | 4 | .05 |
| 42663 D | 4 | 16 | .17 | 42870 D | 8 | 5 | 38.00 | 46045 DA | 13 | 1 | 4.15 |
| 42664 D | 4 | 16 | .12 | 42871 D | 8 | 5 | .60 | 46052 D | 4 | 15 | .05 |
| 42665 D | 4 | 16 | .05 | 42874 DX | 13 | 5 | 7.00 | 46053 D | 4 | 15 | .05 |
| 42666 DX | 4 | 17 | 1.00 | 42875 DX | 13 | 5 | 7.00 | 46054 DA | 4 | 15 | 2.85 |
| 42668 DA | 4 | 17 | .17 | 42877 D | 4 | 5 | .22 | 46351 D | 4 | 3 | .09 |
| 42669 D | 4 | 17 | .40 | 42879 D | 4 | 5 | .12 | 46369 D | 7 | 1 | .03 |
| 42670 D | 4 | 17 | 2.45 | 42880 DA | 4 | 5 | 41.25 | 46644 DX | 4 | 18 | 1.50 |
| 42671 D | 4 | 17 | .95 | 42886 DA | 15 | 1 | 6.00 | 46677 D | 2 | 5 | .75 |
| 42672 D | 4 | 17 | .09 | 42887 DA | 15 | 1 | 6.00 | 46681 DAX | 7 | 3 | 16.00 |
| 42673 D | 4 | 16 | .17 | 42898 DBX | 15 | 1 | 5.75 | 46682 DAX | 7 | 3 | 16.00 |
| 42674 D | 4 | 16 | .40 | 42914 D | 2 | 5 | | 46683 DAX | 7 | 3 | 19.25 |
| 42675 D | 4 | 17 | .30 | 42914 D | 3 | 9 | .17 | 46684 DAX | 7 | 3 | 19.25 |
| 42676 D | 4 | 16 | .12 | 42914 D | 3 | 10 | | 46886 DX | 3 | 7 | .65 |
| 42677 D | 4 | 17 | .12 | 42915 D | 3 | 9 | .12 | 46886 DX | 4 | 17 | |
| 42678 D | 4 | 17 | .09 | 42915 D | 3 | 10 | | 46887 D | 7 | 3 | .40 |
| 42679 D | 4 | 17 | .12 | 42916 D | 3 | 9 | .09 | 47487 D | 4 | 12 | .09 |
| 42680 D | 4 | 17 | .03 | 42916 D | 3 | 10 | | 47487 D | 9 | 1 | .088 |
| 42686 D | 2 | 1 | 38.00 | 42917 D | 3 | 9 | .17 | 47488 D | 4 | 13 | 7.60 |
| 42687 DAX | 4 | 11 | 22.50 | 42917 D | 3 | 10 | | 47488 D | 9 | 1 | 7.60 |
| 42687 DAX | 4 | 11 | 25.30 | 42921 D | 3 | 10 | .30 | 47489 D | 4 | 13 | .12 |
| 42688 DAX | 4 | 11 | 3.70 | 42921 D | 3 | 12 | | 47489 D | 9 | 1 | .12 |
| 42689 DAX | 4 | 11 | 4.30 | 42937 DX | 2 | 1 | 4.80 | 47490 D | 4 | 13 | .17 |
| 42694 D | 4 | 11 | .55 | 42938 D | 2 | 2 | 4.15 | 47490 D | 9 | 1 | .17 |
| 42695 DA | 4 | 11 | 27.35 | 42939 D | 2 | 2 | .35 | 47491 D | 4 | 13 | .60 |
| 42696 DA | 4 | 11 | 171.50 | 42940 D | 2 | 2 | .70 | 47491 D | 9 | 1 | .60 |

(Prices are subject to change without notice)

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|-----------|---------|------|-------|-----------|---------|------|-------|-----------|---------|------|--------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| 47492 D | 4 | 13 | \$.12 | 52405 D | 11 | 4 | \$.17 | 54373 DB | 8 | 11 | \$2.30 |
| 47492 D | 9 | 1 | .12 | 52414 DA | 14 | 3 | 36.50 | 54374 D | 8 | 11 | .40 |
| 47493 D | 4 | 13 | .70 | 52416 D | 7 | 4 | 29.70 | 54411 D | 8 | 12 | .05 |
| 47493 D | 9 | 1 | .70 | 52419 D | 6 | 4 | .05 | 54412 D | 8 | 12 | .05 |
| 47756 DX | 4 | 12 | 5.40 | 52424 DD | 7 | 3 | 99.00 | 54413 D | 8 | 12 | .05 |
| 47757 DX | 4 | 12 | 5.40 | 52425 DD | 7 | 3 | 99.00 | 54416 D | 8 | 12 | .60 |
| 47759 DX | 4 | 12 | 6.00 | 52435 D | 3 | 13 | .12 | 54434 D | 8 | 17 | .15 |
| 47760 DX | 4 | 12 | 8.70 | 52612 D | 8 | 9 | 2.75 | 54435 D | 8 | 17 | .15 |
| 47761 DX | 4 | 12 | 8.55 | 52613 D | 8 | 8 | 12.10 | 54441 D | 8 | 17 | .20 |
| 47763 DX | 4 | 12 | 10.45 | 52621 DX | 11 | 1 | 1.10 | 54462 D | 8 | 17 | .10 |
| 48173 D | 5 | 3 | 7.80 | 52624 D | 11 | 1 | .12 | 54481 D | 8 | 12 | .10 |
| 48178 DA | 12 | 3 | .09 | 52626 D | 11 | 1 | 1.05 | 54486 D | 8 | 7 | .95 |
| 48231 D | 8 | 3 | 1.80 | 52726 DA | 15 | 3 | 11.50 | 54652 D | 12 | 3 | .12 |
| 48232 D | 8 | 3 | .55 | 52855 D | 8 | 7 | .30 | 54909 D | 8 | 9 | 3.00 |
| 48233 D | 8 | 3 | .45 | 52893 D | 14 | 3 | 1.45 | 54910 D | 8 | 8 | 21.80 |
| 48262 D | 4 | 3 | .65 | 53009 D | 14 | 3 | 42.55 | 54911 DX | 8 | 8 | 3.65 |
| 48354 D | 11 | 1 | .09 | 53031 D | 1 | 1 | .004 | 54912 DX | 8 | 8 | 3.65 |
| 48355 D | 11 | 1 | .09 | 53079 D | 8 | 6 | 1.00 | 54913 DX | 8 | 8 | 3.65 |
| 48356 D | 11 | 1 | .35 | 53187 D | 15 | 6 | .75 | 54914 DX | 8 | 8 | 3.65 |
| 48358 D | 11 | 1 | .17 | 53189 D | 15 | 5 | 1.25 | 54915 DX | 8 | 8 | 3.65 |
| 48359 D | 11 | 1 | .22 | 53192 D | 15 | 6 | 11.00 | 54916 DX | 8 | 8 | 3.65 |
| 48438 D | 8 | 3 | 2.75 | 53193 D | 15 | 5 | 1.25 | 54953 D | 5 | 4 | .05 |
| 48564 D | 3 | 4 | 1.20 | 53196 D | 15 | 6 | .75 | 54968 D | 12 | 3 | .12 |
| 48695 D | 4 | 15 | .30 | 53233 D | 12 | 3 | 20.00 | 54978 DX | 8 | 3 | .75 |
| 48906 D | 11 | 4 | .17 | 53389 D | 12 | 3 | 4.00 | 55307 DX | 4 | 3 | 1.35 |
| 49104 D | 13 | 4 | .50 | 53612 D | 4 | 11 | 1.55 | 55339 D | 7 | 3 | 5.40 |
| 49106 D | 2 | 5 | 1.35 | 53643 D | 4 | 4 | .07 | 55354 DA | 11 | 1 | .17 |
| 49186 DX | 3 | 8 | | 53717 DA | 14 | 1 | .12 | 55361 D | 8 | 11 | .10 |
| 49186 DX | 3 | 11 | .65 | 53742 DA | 12 | 3 | .30 | 55377 D | 12 | 5 | .09 |
| 49364 DA | 4 | 1 | 2.10 | 53899 D | 14 | 2 | .22 | 55428 DA | 8 | 16 | .05 |
| 49450 D | 8 | 9 | 8.80 | 54085 D | 11 | 1 | .22 | 55468 D | 3 | 10 | 38.50 |
| 49451 D | 8 | 9 | .03 | 54110 D | 6 | 5 | .03 | 55468 D | 3 | 13 | |
| 49453 DX | 8 | 9 | 2.75 | 54111 D | 7 | 3 | .12 | 55479 D | 15 | 5 | .12 |
| 49454 D | 8 | 9 | 4.15 | 54124 D | 11 | 1 | .17 | 55748 D | 11 | 4 | .07 |
| 50092 D | 15 | 3 | .22 | 54125 D | 11 | 1 | .12 | 55844 D | 14 | 3 | 14.40 |
| 50098 DA | 12 | 3 | .30 | 54128 D | 6 | 1 | .12 | 56005 D | 12 | 1 | .90 |
| 50098 DAX | 12 | 3 | .35 | 54129 D | 6 | 1 | .12 | 56006 D | 12 | 2 | .09 |
| 50099 D | 12 | 3 | .22 | 54130 D | 6 | 1 | 7.15 | 56007 D | 12 | 1 | .30 |
| 50148 D | 8 | 3 | .85 | 54131 D | 6 | 1 | .17 | 56008 D | 12 | 1 | .05 |
| 50180 D | 7 | 5 | .22 | 54132 DA | 6 | 1 | .10 | 56009 D | 12 | 1 | .05 |
| 50181 D | 7 | 5 | .40 | 54134 D | 6 | 1 | 57.25 | 56010 D | 12 | 1 | .22 |
| 50234 D | 3 | 13 | .08 | 54158 D | 4 | 7 | | 56011 D | 7 | 1 | .35 |
| 50235 D | 3 | 13 | .08 | 54158 D | 4 | 8 | .17 | 56012 D | 12 | 5 | 1.35 |
| 50335 D | 4 | 15 | 3.85 | 54290 D | 8 | 11 | .10 | 56013 DX | 12 | 2 | .40 |
| 50336 D | 4 | 15 | 3.85 | 54291 D | 8 | 11 | .05 | 56014 D | 7 | 1 | .07 |
| 50410 DA | 4 | 4 | | 54293 D | 8 | 11 | 1.50 | 56017 D | 12 | 1 | .12 |
| 50410 DA | 4 | 8 | .09 | 54295 D | 8 | 11 | .60 | 56018 D | 12 | 3 | 6.00 |
| 50410 DA | 4 | 9 | | 54296 D | 8 | 11 | .05 | 56081 DX | 8 | 3 | .90 |
| 50474 DA | 4 | 4 | .12 | 54297 D | 8 | 11 | .05 | 56111 D | 8 | 11 | 16.50 |
| 50585 D | 3 | 7 | | 54298 D | 8 | 11 | .05 | 56112 DX | 8 | 11 | 2.50 |
| 50585 D | 3 | 9 | 25.00 | 54299 D | 8 | 12 | .25 | 56113 D | 8 | 11 | .10 |
| 50585 D | 3 | 10 | | 54306 D | 8 | 12 | .20 | 56121 D | 8 | 12 | .90 |
| 50607 D | 8 | 3 | .45 | 54320 D | 8 | 11 | 1.25 | 56133 D | 7 | 3 | 51.00 |
| 50607 DX | 8 | 3 | .60 | 54326 D | 8 | 11 | 3.60 | 56133 D | 13 | 2 | 51.00 |
| 50677 D | 4 | 8 | .07 | 54329 D | 8 | 11 | .30 | 56134 D | 7 | 3 | 51.00 |
| 50784 D | 3 | 12 | .90 | 54330 D | 8 | 11 | .95 | 56134 D | 13 | 2 | 51.00 |
| 50790 D | 2 | 1 | .05 | 54331 D | 8 | 11 | .90 | 56291 D | 8 | 9 | 2.75 |
| 50822 D | 12 | 3 | .05 | 54332 D | 8 | 11 | .05 | 56456 D | 11 | 3 | 4.40 |
| 50827 D | 11 | 1 | .17 | 54333 DA | 8 | 12 | .95 | 56457 DA | 11 | 1 | 1.75 |
| 51066 DBX | 8 | 3 | | 54334 D | 8 | 11 | .40 | 56458 D | 3 | 7 | .17 |
| 51066 DBX | 8 | 7 | 1.65 | 54335 D | 8 | 12 | .95 | 56459 DBX | 11 | 1 | .85 |
| 51238 D | 6 | 1 | .17 | 54337 D | 8 | 11 | 11.00 | 56460 D | 11 | 1 | 1.10 |
| 51529 D | 11 | 1 | .05 | 54345 DA | 8 | 12 | 4.20 | 56463 D | 11 | 1 | .65 |
| 51502 D | 1 | 1 | .09 | 54346 D | 8 | 12 | .20 | 56464 D | 4 | 8 | 49.50 |
| 51515 D | 4 | 15 | 2.45 | 54347 D | 8 | 12 | .10 | 56465 D | 14 | 2 | .55 |
| 51516 D | 4 | 15 | 2.45 | 54348 DEX | 8 | 12 | 2.90 | 56467 D | 14 | 2 | 9.50 |
| 51527 D | 8 | 7 | .03 | 54349 D | 8 | 12 | .25 | 56468 D | 14 | 2 | 26.15 |
| 51893 D | 3 | 12 | .50 | 54350 D | 8 | 12 | .45 | 56475 D | 12 | 7 | .09 |
| 52033 D | 2 | 5 | .011 | 54351 D | 8 | 12 | .30 | 56476 D | 12 | 7 | .07 |
| 52128 D | 8 | 9 | .05 | 54364 DB | 8 | 13 | .05 | 56478 D | 12 | 7 | .22 |
| 52348 D | 14 | 1 | 1.90 | 54366 D | 8 | 13 | .90 | 56599 DX | 3 | 4 | 7.15 |
| 52390 D | 10 | 1 | 2.85 | 54367 D | 8 | 13 | .45 | 56617 D | 8 | 8 | .12 |
| 52403 D | 11 | 4 | .45 | 54371 D | 8 | 13 | .10 | 56996 DX | 5 | 4 | 14.95 |
| 52404 D | 11 | 4 | .17 | 54372 DB | 8 | 11 | 3.10 | 57099 D | 12 | 1 | 6.60 |

(Prices are subject to change without notice)

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|-----------|---------|------|---------|-----------|---------|------|---------|----------|---------|------|--------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| 57100 DXA | 7 | 1 | \$25.00 | 60913 DNS | 3 | 8 | | 62219 D | 8 | 15 | \$.65 |
| 57101 DX | 12 | 1 | .75 | 60913 D | 3 | 9 | | 62220 D | 8 | 15 | .05 |
| 57102 D | 12 | 3 | .17 | 60913 DNS | 3 | 10 | \$39.95 | 62221 D | 8 | 15 | 2.10 |
| 57103 DX | 12 | 1 | .75 | 60913 DNS | 3 | 13 | | 62222 D | 8 | 15 | .65 |
| 57237 DA | 7 | 8 | 11.85 | 60938 D | 3 | 10 | .05 | 62223 D | 8 | 15 | .05 |
| 57241 D | 7 | 8 | 3.85 | 61111 D | 8 | 11 | .10 | 62224 D | 8 | 15 | .10 |
| 57288 D | 12 | 5 | .35 | 61111 D | 8 | 13 | | 62225 DX | 8 | 15 | 1.75 |
| 57311 DX | 3 | 9 | | 61115 D | 5 | 4 | .07 | 62227 D | 8 | 15 | .20 |
| 57311 DX | 3 | 10 | 1.90 | 61128 D | 5 | 4 | .15 | 62228 D | 8 | 15 | .15 |
| 57311 DX | 3 | 11 | | 61130 D | 5 | 4 | .25 | 62229 DX | 8 | 15 | 6.25 |
| 57312 D | 3 | 11 | .02 | 61208 D | 8 | 9 | .05 | 62233 D | 8 | 16 | 1.60 |
| 57313 D | 3 | 11 | .12 | 61209 D | 8 | 9 | .05 | 62235 D | 8 | 16 | .10 |
| 57386 D | 7 | 1 | .35 | 61271 D | 3 | 9 | | 62236 D | 8 | 15 | 5.25 |
| 57387 D | 7 | 1 | .40 | 61271 D | 3 | 10 | | 62237 DX | 8 | 15 | 1.85 |
| 57550 D | 3 | 7 | | 61299 D12 | 8 | 3 | | 62242 D | 8 | 15 | .05 |
| 57550 D | 3 | 10 | 1.25 | 61299 D12 | 8 | 8 | | 62243 DA | 8 | 17 | 1.75 |
| 57624 D | 4 | 13 | | 61404 DX | 8 | 3 | .65 | 62246 DX | 8 | 15 | .90 |
| 57624 D | 9 | 1 | 4.20 | 61405 DX | 8 | 3 | .75 | 62247 D | 8 | 15 | .15 |
| 57734 D | 13 | 4 | .17 | 61406 DX | 8 | 3 | .75 | 62248 D | 8 | 15 | .10 |
| 57750 D | 12 | 3 | .03 | 61407 DX | 8 | 9 | .50 | 62249 D | 8 | 15 | .05 |
| 57957 D | 8 | 6 | .03 | 61732 D | 15 | 5 | .25 | 62250 DX | 8 | 17 | .75 |
| 58075 DA | 13 | 1 | .10 | 61733 D | 15 | 5 | .50 | 62253 D | 8 | 17 | .50 |
| 58123 D | 11 | 1 | 1.00 | 61735 D | 15 | 5 | .30 | 62254 D | 8 | 17 | .20 |
| 58150 DX | 11 | 1 | .60 | 61736 D | 15 | 5 | 5.50 | 62256 DX | 8 | 17 | 1.65 |
| 58185 D | 4 | 1 | .50 | 61737 D | 15 | 5 | 2.00 | 62259 D | 8 | 17 | 1.10 |
| 58194 D | 7 | 4 | 29.70 | 61738 D | 15 | 5 | 1.40 | 62260 D | 8 | 17 | .20 |
| 58199 DA | 1 | 1 | 19.25 | 61739 D | 15 | 5 | 1.00 | 62261 D | 8 | 17 | .20 |
| 58200 D | 4 | 1 | 32.30 | 61740 D | 15 | 5 | 2.00 | 62262 D | 8 | 17 | .10 |
| 58202 D | 1 | 1 | .22 | 61808 D | 4 | 8 | .70 | 62263 DX | 8 | 16 | 1.15 |
| 58204 D | 1 | 1 | .22 | 61910 D | 8 | 11 | | 62264 D | 8 | 16 | .10 |
| 58205 D | 11 | 4 | .22 | 61913 D | 6 | 5 | .036 | 62265 D | 8 | 16 | .05 |
| 58206 D | 11 | 4 | .55 | 61917 D | 8 | 12 | .10 | 62267 D | 8 | 16 | .60 |
| 58209 D | 4 | 1 | .50 | 61919 DX | 8 | 12 | 73.50 | 62270 D | 8 | 15 | .50 |
| 58210 D | 4 | 1 | .12 | 61956 D | 8 | 12 | .10 | 62271 D | 8 | 15 | .05 |
| 58213 D | 4 | 1 | 2.75 | 61958 D | 8 | 12 | .15 | 62273 D | 8 | 16 | 4.50 |
| 58214 D | 4 | 1 | .55 | 61959 DX | 8 | 12 | .30 | 62274 D | 8 | 16 | .10 |
| 58218 D | 4 | 1 | .17 | 61964 D | 8 | 12 | 3.75 | 62275 D | 8 | 16 | .10 |
| 58243 D | 3 | 4 | .03 | 61965 D | 8 | 11 | .25 | 62276 D | 8 | 16 | .10 |
| 58253 D | 4 | 8 | .17 | 61969 D | 8 | 11 | .05 | 62302 D | 3 | 10 | .10 |
| 58255 D | 11 | 1 | .22 | 61970 D | 8 | 12 | .10 | 62352 D | 15 | 5 | 12.25 |
| 58378 D | 15 | 2 | 1.90 | 62116 D | 8 | 11 | 2.50 | 62549 D | 15 | 1 | 11.00 |
| 58836 D | 8 | 5 | | 62117 D | 8 | 12 | .65 | 62550 D | 15 | 1 | 11.00 |
| 58836 D | 8 | 6 | .05 | 62119 D | 8 | 12 | .15 | 62562 DX | 15 | 1 | 54.45 |
| 58920 DAX | 15 | 3 | .85 | 62120 D | 8 | 11 | .05 | 62575 D | 15 | 5 | .10 |
| 58955 DA | 7 | 7 | 2.65 | 62121 D | 8 | 12 | .15 | 62574 D | 15 | 5 | .25 |
| 58960 D | 4 | 15 | .55 | 62123 D | 8 | 11 | .05 | 62622 D | 8 | 12 | .05 |
| 58989 D | 7 | 1 | .85 | 62124 D | 8 | 12 | .50 | 62625 D | 8 | 15 | 2.05 |
| 58997 D | 7 | 1 | .55 | 62125 D | 8 | 13 | 18.75 | 62626 D | 8 | 16 | .05 |
| 59107 DX | 15 | 2 | 11.00 | 62126 DX | 8 | 13 | 10.40 | 62627 D | 8 | 16 | .05 |
| 59184 D | 3 | 9 | | 62129 D | 8 | 13 | .05 | 62628 D | 8 | 15 | .40 |
| 59184 D | 3 | 11 | 2.45 | 62159 D | 15 | 5 | .75 | 62633 D | 8 | 16 | .10 |
| 59237 D | 7 | 5 | .40 | 62192 D | 8 | 15 | 84.00 | 62637 D | 8 | 17 | .05 |
| 59247 D | 4 | 17 | .09 | 62193 D | 8 | 12 | 12.00 | 62638 D | 8 | 17 | .05 |
| 59416 D | 4 | 1 | 26.40 | 62195 D | 8 | 12 | 5.40 | 62639 D | 8 | 17 | .05 |
| 59708 D | 8 | 12 | .22 | 62196 D | 8 | 12 | .65 | 62640 D | 8 | 17 | .05 |
| 59989 D | 3 | 10 | .35 | 62197 D | 8 | 12 | .65 | 62641 D | 8 | 17 | .05 |
| 59990 DX | 1 | 1 | .85 | 62198 D | 8 | 12 | .05 | 62642 D | 8 | 17 | .05 |
| 59991 D | 1 | 1 | .22 | 62199 D | 8 | 12 | .05 | 62643 D | 8 | 17 | .05 |
| 60012 D | 15 | 3 | | 62201 D | 8 | 16 | 14.00 | 62644 D | 8 | 17 | .05 |
| 60012 D | 15 | 5 | 27.50 | 62203 D | 8 | 17 | .15 | 62780 D | 14 | 2 | .06 |
| 60013 D | 15 | 5 | 16.50 | 62204 D | 8 | 16 | .10 | 62780 DX | 14 | 2 | .20 |
| 60015 DX | 8 | 3 | 1.00 | 62205 D | 8 | 15 | | 62781 D | 14 | 3 | .05 |
| 60250 D | 13 | 3 | .85 | 62205 D | 8 | 16 | .05 | 62782 D | 14 | 2 | .05 |
| 60259 D | 12 | 7 | .17 | 62205 D | 8 | 17 | | 62863 D | 4 | 4 | .20 |
| 60260 DA | 12 | 7 | 12.60 | 62206 D | 8 | 18 | .05 | 62866 D | 4 | 3 | .10 |
| 60740 D | 8 | 16 | 1.40 | 62207 D | 8 | 16 | .05 | 63007 D | 2 | 2 | 19.50 |
| 60805 D | 1 | 1 | .10 | 62208 D | 8 | 16 | .15 | 63228 D | 12 | 5 | .60 |
| 60870 D | 8 | 3 | 5.50 | 62209 D | 8 | 16 | .15 | 63229 D | 12 | 5 | .60 |
| 60870 D | 8 | 7 | | 62210 D | 8 | 16 | .30 | 63230 DX | 12 | 5 | .80 |
| 60871 D | 8 | 7 | .25 | 62211 D | 8 | 16 | .05 | 63266 D | 7 | 8 | .22 |
| 60872 D | 8 | 7 | .95 | 62213 D | 8 | 15 | 26.50 | 63282 D | 4 | 13 | .05 |
| 60877 D | 8 | 7 | .15 | 62214 D | 8 | 15 | 10.90 | 63323 D | 3 | 10 | .05 |
| 60878 DX | 8 | 7 | .95 | 62217 DX | 8 | 15 | 2.25 | 63327 DX | 4 | 12 | 9.00 |
| | | | | 62218 D | 8 | 15 | .20 | 63328 DX | 4 | 12 | 17.00 |

(Prices are subject to change without notice)

| | | | |
|--|--|---------|--|
| | | Section | |
|--|--|---------|--|

(Prices are subject to change without notice)

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|----------|---------|------|--------|----------|---------|------|--------|----------|---------|------|--------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| Q 1800 | 2 | 5 | | Q 1853 | 10 | 1 | \$.063 | Q 1909 | 2 | 2 | |
| Q 1800 | 3 | 7 | | Q 1854 | 2 | 5 | | Q 1909 | 3 | 6 | |
| Q 1800 | 3 | 10 | | Q 1854 | 4 | 3 | | Q 1909 | 3 | 10 | |
| Q 1800 | 4 | 4 | | Q 1854 | 8 | 9 | .063 | Q 1909 | 4 | 7 | |
| Q 1800 | 4 | 15 | | Q 1854 | 11 | 3 | | Q 1909 | 4 | 8 | |
| Q 1800 | 6 | 3 | | Q 1855 | 3 | 6 | | Q 1909 | 5 | 4 | |
| Q 1800 | 6 | 5 | \$.021 | Q 1855 | 6 | 3 | | Q 1909 | 6 | 3 | |
| Q 1800 | 7 | 1 | | Q 1855 | 6 | 4 | .067 | Q 1909 | 7 | 5 | \$.025 |
| Q 1800 | 8 | 3 | | Q 1855 | 13 | 5 | | Q 1909 | 7 | 7 | |
| Q 1800 | 8 | 8 | | Q 1856 | 1 | 1 | | Q 1909 | 8 | 9 | |
| Q 1800 | 10 | 1 | | Q 1857 | 3 | 6 | .072 | Q 1909 | 10 | 1 | |
| Q 1800 | 14 | 2 | | Q 1858 | 3 | 13 | | Q 1909 | 11 | 4 | |
| Q 1800 | 15 | 2 | | Q 1858 | 14 | 3 | .072 | Q 1909 | 13 | 5 | |
| Q 1801 | 10 | 1 | | Q 1858 | 15 | 3 | | Q 1909 | 14 | 2 | |
| Q 1801 | 14 | 1 | .023 | Q 1860 | 2 | 1 | | Q 1909 | 15 | 1 | |
| Q 1802 | 1 | 1 | | Q 1860 | 2 | 3 | .077 | Q 1910 | 4 | 8 | |
| Q 1802 | 2 | 1 | | Q 1862 | 2 | 1 | .082 | Q 1910 | 14 | 1 | .025 |
| Q 1802 | 2 | 2 | | Q 1864 | 6 | 4 | | Q 1911 | 1 | 1 | |
| Q 1802 | 2 | 4 | | Q 1864 | 8 | 6 | .087 | Q 1911 | 4 | 3 | |
| Q 1802 | 4 | 4 | | Q 1865 | 2 | 2 | .134 | Q 1911 | 4 | 4 | |
| Q 1802 | 4 | 12 | | Q 1867 | 12 | 3 | .092 | Q 1911 | 5 | 4 | |
| Q 1802 | 4 | 17 | .023 | Q 1870 | 15 | 3 | .098 | Q 1911 | 6 | 3 | |
| Q 1802 | 4 | 1 | | Q 1872 | 6 | 3 | | Q 1911 | 6 | 4 | .042 |
| Q 1802 | 8 | 5 | | Q 1872 | 12 | 2 | .104 | Q 1911 | 7 | 3 | |
| Q 1802 | 8 | 7 | | Q 1872 | 13 | 4 | | Q 1911 | 12 | 2 | |
| Q 1802 | 14 | 2 | | Q 1873 | 7 | 3 | | Q 1911 | 12 | 7 | |
| Q 1802 | 15 | 2 | | Q 1873 | 15 | 1 | .11 | Q 1911 | 13 | 2 | |
| Q 1803 | 2 | 2 | .025 | Q 1874 | 5 | 3 | .11 | Q 1911 | 15 | 1 | |
| Q 1804 | 2 | 5 | | Q 1877 | 1 | 1 | | Q 1912 | 12 | 7 | .042 |
| Q 1804 | 4 | 3 | | Q 1877 | 5 | 4 | .122 | Q 1913 | 6 | 4 | |
| Q 1804 | 4 | 7 | .025 | Q 1877 | 15 | 1 | | Q 1913 | 7 | 3 | |
| Q 1804 | 8 | 9 | | Q 1884 | 7 | 1 | .133 | Q 1913 | 7 | 5 | .06 |
| Q 1804 | 14 | 3 | | Q 1889 | 6 | 4 | .157 | Q 1913 | 12 | 7 | |
| Q 1805 | 8 | 3 | .027 | Q 1889 | 7 | 5 | | Q 1915 | 3 | 12 | .002 |
| Q 1806 | 2 | 5 | .027 | Q 1890 | 6 | 4 | | Q 1916 | 4 | 16 | .002 |
| Q 1808 | 3 | 10 | | Q 1890 | 7 | 4 | .157 | Q 1916 | 4 | 17 | |
| Q 1808 | 4 | 15 | .03 | Q 1890 | 7 | 5 | | Q 1918 | 3 | 6 | |
| Q 1809 | 8 | 9 | .033 | Q 1890 | 15 | 1 | | Q 1918 | 3 | 7 | |
| Q 1813 | 12 | 5 | .039 | Q 1891 | 6 | 4 | .165 | Q 1918 | 3 | 10 | |
| Q 1814 | 11 | 1 | .039 | Q 1892 | 7 | 8 | .165 | Q 1918 | 6 | 4 | .002 |
| Q 1818 | 4 | 7 | | Q 1897 | 7 | 3 | .233 | Q 1918 | 6 | 4 | |
| Q 1818 | 4 | 15 | .047 | Q 1901 | 3 | 7 | | Q 1918 | 8 | 9 | |
| Q 1818 | 11 | 3 | | Q 1901 | 3 | 10 | .007 | Q 1918 | 12 | 1 | |
| Q 1832 | 3 | 7 | | Q 1901 | 8 | 15 | | Q 1919 | 3 | 7 | |
| Q 1832 | 4 | 17 | .035 | Q 1901 | 8 | 17 | | Q 1919 | 3 | 10 | |
| Q 1834 | 12 | 1 | .038 | Q 1902 | 3 | 7 | | Q 1919 | 4 | 3 | |
| Q 1836 | 3 | 7 | .041 | Q 1902 | 8 | 12 | .007 | Q 1919 | 4 | 18 | |
| Q 1846 | 8 | 3 | | Q 1902 | 12 | 1 | | Q 1919 | 4 | 17 | |
| Q 1846 | 10 | 1 | .047 | Q 1903 | 2 | 1 | | Q 1919 | 4 | 15 | .003 |
| Q 1847 | 3 | 10 | | Q 1903 | 3 | 10 | | Q 1919 | 5 | 3 | |
| Q 1847 | 10 | 1 | .051 | Q 1903 | 4 | 18 | | Q 1919 | 7 | 1 | |
| Q 1847 | 15 | 1 | | Q 1903 | 5 | 4 | .01 | Q 1919 | 10 | 1 | |
| Q 1848 | 3 | 10 | | Q 1903 | 8 | 16 | | Q 1919 | 11 | 1 | |
| Q 1848 | 4 | 3 | | Q 1903 | 11 | 1 | | Q 1919 | 11 | 3 | |
| Q 1848 | 4 | 1 | .051 | Q 1903 | 11 | 3 | | Q 1919 | 12 | 3 | |
| Q 1848 | 7 | 3 | | Q 1904 | 3 | 13 | | Q 1919 | 12 | 5 | |
| Q 1848 | 8 | 9 | | Q 1904 | 10 | 1 | .01 | | | | |
| Q 1848 | 11 | 4 | | Q 1904 | 12 | 3 | | | | | |
| Q 1849 | 3 | 10 | | Q 1905 | 2 | 2 | | | | | |
| Q 1849 | 13 | 3 | | Q 1905 | 3 | 10 | | | | | |
| Q 1849 | 14 | 2 | .055 | Q 1905 | 4 | 4 | | | | | |
| Q 1849 | 14 | 3 | | Q 1905 | 4 | 7 | | | | | |
| Q 1850 | 4 | 8 | | Q 1905 | 4 | 8 | | | | | |
| Q 1850 | 4 | 1 | .055 | Q 1905 | 4 | 13 | | | | | |
| Q 1850 | 7 | 1 | | Q 1905 | 4 | 15 | .013 | | | | |
| Q 1850 | 8 | 3 | | Q 1905 | 7 | 5 | | | | | |
| Q 1850 | 12 | 3 | | Q 1905 | 8 | 3 | | | | | |
| Q 1851 | 15 | 1 | .059 | Q 1905 | 9 | 1 | | | | | |
| Q 1852 | 2 | 3 | | Q 1905 | 10 | 1 | | | | | |
| Q 1852 | 2 | 5 | | Q 1905 | 11 | 4 | | | | | |
| Q 1852 | 4 | 9 | | Q 1905 | 12 | 5 | | | | | |
| Q 1852 | 4 | 1 | .059 | Q 1906 | 4 | 3 | | | | | |
| Q 1852 | 7 | 1 | | Q 1906 | 10 | 1 | | | | | |
| Q 1852 | 8 | 8 | | Q 1906 | 11 | 4 | .013 | | | | |
| Q 1852 | 14 | 1 | | Q 1906 | 15 | 2 | | | | | |
| Q 1852 | 15 | 1 | | | | | | | | | |

(Prices are subject to change without notice)

NUMERICAL INDEX

| Part No. | Section | | Price | Part No. | Section | | Price | Part No. | Section | | Price |
|----------|---------|------|---------|----------|---------|------|--------|----------|---------|------|---------|
| | No. | Page | | | No. | Page | | | No. | Page | |
| Q 1920 | 1 | 1 | | Q 1925 | 7 | | | S | | | |
| Q 1920 | 1 | 7 | | Q 1925 | 12 | | | SA 3215 | 13 | 4 | \$.085 |
| Q 1920 | 3 | 10 | | Q 1925 | 12 | 3 | | ST 205 A | 2 | 1 | 2.70 |
| Q 1920 | 4 | 3 | | Q 1925 | 13 | 1 | \$.01 | ST 205 A | 12 | 1 | 2.70 |
| Q 1920 | 4 | 4 | | Q 1925 | 13 | 2 | | ST 207 | 2 | 2 | 1.65 |
| Q 1920 | 4 | 5 | | Q 1925 | 15 | 1 | | ST 208 | 8 | 9 | 1.85 |
| Q 1920 | 4 | 7 | | Q 1927 | 6 | 4 | | ST 213 | 8 | 9 | 2.20 |
| Q 1920 | 4 | 12 | | Q 1927 | 7 | 1 | | ST 223 | 14 | 1 | 9.40 |
| Q 1920 | 4 | 17 | | Q 1927 | 7 | 3 | | ST 227 | 14 | 2 | 7.00 |
| Q 1920 | 4 | 15 | | Q 1927 | 7 | 4 | | ST 228 | 14 | 2 | 10.40 |
| Q 1920 | 4 | 1 | | Q 1927 | 7 | 5 | .017 | | | | |
| Q 1920 | 6 | 3 | | Q 1927 | 7 | 8 | | | | | |
| Q 1920 | 6 | 5 | | Q 1927 | 12 | 7 | | | | | |
| Q 1920 | 7 | 1 | | Q 1927 | 13 | 4 | | | | | |
| Q 1920 | 7 | 3 | \$.004 | Q 1927 | 15 | 1 | | | | | |
| Q 1920 | 7 | 5 | | Q 1929 | 4 | 5 | | | | | |
| Q 1920 | 8 | 3 | | Q 1929 | 7 | 3 | | T | | | |
| Q 1920 | 8 | 5 | | Q 1929 | 7 | 4 | | | | | |
| Q 1920 | 8 | 7 | | Q 1929 | 7 | 5 | | | | | |
| Q 1920 | 8 | 8 | | Q 1929 | 7 | 7 | .027 | 1924 T | 3 | 7 | .03 |
| Q 1920 | 8 | 9 | | Q 1929 | 7 | 8 | | 2583 T | 15 | 3 | .90 |
| Q 1920 | 10 | 1 | | Q 1929 | 15 | 1 | | 2584 T | 15 | 3 | 4.50 |
| Q 1920 | 11 | 1 | | Q 3505 | 3 | 13 | .05 | 2587 T | 15 | 3 | .35 |
| Q 1920 | 11 | 3 | | Q 3615 | 2 | 1 | | 2588 T | 15 | 3 | .25 |
| Q 1920 | 12 | 5 | | Q 3615 | 2 | 2 | | 3741 T | 5 | 4 | .05 |
| Q 1920 | 14 | 1 | | Q 3615 | 4 | 4 | | 4167 T | 3 | 4 | .007 |
| Q 1920 | 14 | 2 | | Q 3615 | 5 | 4 | | 4167 T | 3 | 6 | .007 |
| Q 1920 | 14 | 3 | | Q 3615 | 6 | 4 | .05 | 4167 T | 4 | 17 | .007 |
| Q 1920 | 15 | 2 | | Q 3615 | 7 | 5 | | 5312 T 3 | 15 | 15 | .03 |
| Q 1921 | 3 | 7 | | Q 3615 | 7 | 8 | | 7220 T | 8 | 9 | |
| Q 1921 | 4 | 17 | .004 | Q 3615 | 11 | 4 | | 7220 T | 14 | 1 | .013 |
| Q 1921 | 12 | 1 | | Q 3615 | 12 | 1 | | 8522 T | 2 | 2 | 1.65 |
| Q 1922 | 1 | 1 | | Q 3615 | 12 | 5 | | 9982 T | 4 | 9 | |
| Q 1922 | 3 | 6 | | Q 3618 | 12 | 3 | .11 | 9982 T | 6 | 3 | .60 |
| Q 1922 | 3 | 10 | | Q 3621 | 12 | 7 | .09 | | | | |
| Q 1922 | 4 | 3 | | Q 3625 | 5 | 4 | .09 | U | | | |
| Q 1922 | 4 | 8 | | Q 3627 | 5 | 4 | .15 | U 14284 | 4 | 18 | .17 |
| Q 1922 | 4 | 9 | | Q 3628 | 2 | 1 | .15 | | | | |
| Q 1922 | 4 | 15 | | Q 3659 | 2 | 1 | | | | | |
| Q 1922 | 4 | 1 | | Q 3794 | 15 | 3 | 4.00 | | | | |
| Q 1922 | 5 | 3 | | Q 3794 | 15 | 7 | | V | | | |
| Q 1922 | 6 | 2 | | Q 4000 | 3 | 7 | | | | | |
| Q 1922 | 6 | 3 | | Q 4000 | 6 | 3 | .014 | | | | |
| Q 1922 | 6 | 4 | | Q 4000 | 6 | 4 | | | | | |
| Q 1922 | 7 | 1 | | Q 4012 | 4 | 4 | .016 | 1627 V | 3 | 9 | .05 |
| Q 1922 | 7 | 3 | | Q 4014 | 4 | 3 | .016 | 10430 V | 5 | 3 | .036 |
| Q 1922 | 7 | 5 | | Q 4016 | 1 | 1 | | 10439 VA | 3 | 9 | |
| Q 1922 | 8 | 3 | | Q 4016 | 2 | 5 | | 10439 VA | 3 | 11 | .066 |
| Q 1922 | 8 | 7 | .005 | Q 4016 | 3 | 7 | .02 | 10690 V | 14 | 2 | 4.65 |
| Q 1922 | 8 | 8 | | Q 4016 | 7 | 3 | | 10765 V | 11 | 1 | .033 |
| Q 1922 | 8 | 9 | | Q 4016 | 10 | 1 | | 10789 V | 3 | 8 | .033 |
| Q 1922 | 8 | 11 | | Q 4017 | 4 | 3 | | 10815 V | 3 | 9 | |
| Q 1922 | 8 | 12 | | Q 4017 | 4 | 4 | | 10815 V | 3 | 11 | .044 |
| Q 1922 | 10 | 1 | | Q 4017 | 4 | 1 | .022 | 23007 V | 4 | 17 | |
| Q 1922 | 11 | 3 | | Q 4017 | 8 | 8 | | 23007 V | 14 | 3 | .033 |
| Q 1922 | 11 | 4 | | Q 4018 | 4 | 12 | .059 | 41513 V | 14 | 2 | 10.40 |
| Q 1922 | 12 | 3 | | Q 4019 | 4 | 15 | .068 | 51344 V | 8 | 7 | .10 |
| Q 1922 | 12 | 5 | | Q 4020 | 8 | 9 | .02 | 52745 V | 6 | 11 | |
| Q 1922 | 12 | 7 | | Q 4043 | 2 | 1 | .092 | 52745 V | 6 | 12 | |
| Q 1922 | 13 | 3 | | Q 4044 | 2 | 1 | .098 | 52745 V | 6 | 15 | .003 |
| Q 1922 | 13 | 5 | | Q 4048 | 4 | 9 | .146 | 52745 V | 6 | 16 | |
| Q 1922 | 14 | 1 | | Q 4050 | 7 | 5 | .049 | 52745 V | 15 | 5 | |
| Q 1922 | 14 | 2 | | Q 4053 | 8 | 9 | .104 | 61175 V | 12 | 7 | .009 |
| Q 1922 | 14 | 3 | | Q 4126 | 7 | 8 | .282 | | | | |
| Q 1922 | 15 | 1 | | Q 4134 | 7 | 3 | .198 | | | | |
| Q 1925 | 1 | 1 | | Q 4138 | 7 | 3 | .242 | W | | | |
| Q 1925 | 3 | 12 | | Q 4140 | 7 | 3 | .282 | | | | |
| Q 1925 | 4 | 4 | | Q 4147 | 7 | 4 | .253 | | | | |
| Q 1925 | 5 | 3 | | Q 4150 | 7 | 7 | .30 | W 16210 | 2 | 2 | |
| Q 1925 | 5 | 4 | | Q 4154 | 7 | 7 | .37 | | | | |
| Q 1925 | 6 | 3 | .01 | Q 4155 | 7 | 7 | .39 | | | | |
| Q 1925 | 6 | 4 | | Q 4163 | 15 | 1 | .246 | Y | | | |
| Q 1925 | 6 | 5 | | Q 4166 | 7 | 3 | .286 | | | | |
| Q 1925 | 6 | 7 | | Q 4168 | 7 | 3 | .315 | | | | |
| Q 1925 | 7 | 3 | | Q 4186 | 7 | 8 | .44 | 1627 Y | 3 | 11 | .05 |

(Prices are subject to change without notice)

SPARE PARTS CATALOG

MEMORANDA

SPARE PARTS CATALOG

MEMORANDA

4542-0E

TDR 9249TK

